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A Continuing Bibliography with Indexes

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NASA SP-7011 (208)

AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

(Supplement 208)

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in June1980 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA).*

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INTRODUCTION

This Supplement to *Aerospace Medicine and Biology* (NASA SP-7011) lists 138 reports, articles and other documents announced during June 1980 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*. The first issue of the bibliography was published in July 1964; since that time, monthly supplements have been issued.

In its subject coverage, *Aerospace Medicine and Biology* concentrates on the biological, physiological, psychological, and environmental effects to which man is subjected during and following simulated or actual flight in the earth's atmosphere or in interplanetary space. References describing similar effects of biological organisms of lower order are also included. Such related topics as sanitary problems, pharmacology, toxicology, safety and survival, life support systems, exobiology, and personnel factors receive appropriate attention. In general, emphasis is placed on applied research, but references to fundamental studies and theoretical principles related to experimental development also qualify for inclusion.

Each entry in the bibliography consists of a bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections: *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Two indexes -- subject and personal author -- are included.

An annual index will be prepared at the end of the calendar year covering all documents listed in the 1980 Supplements.

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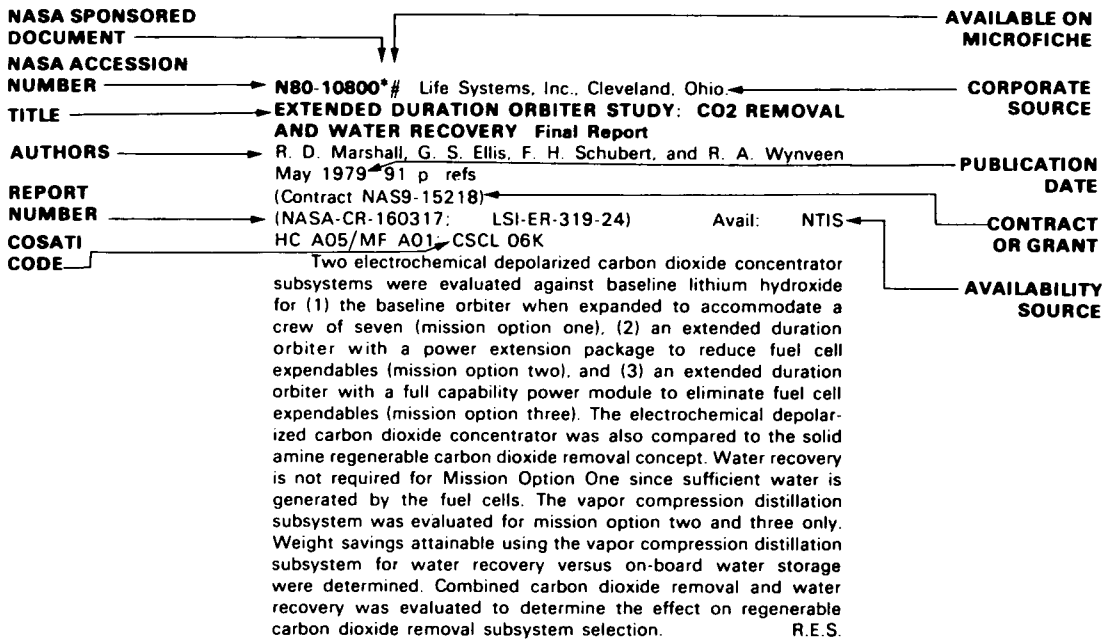

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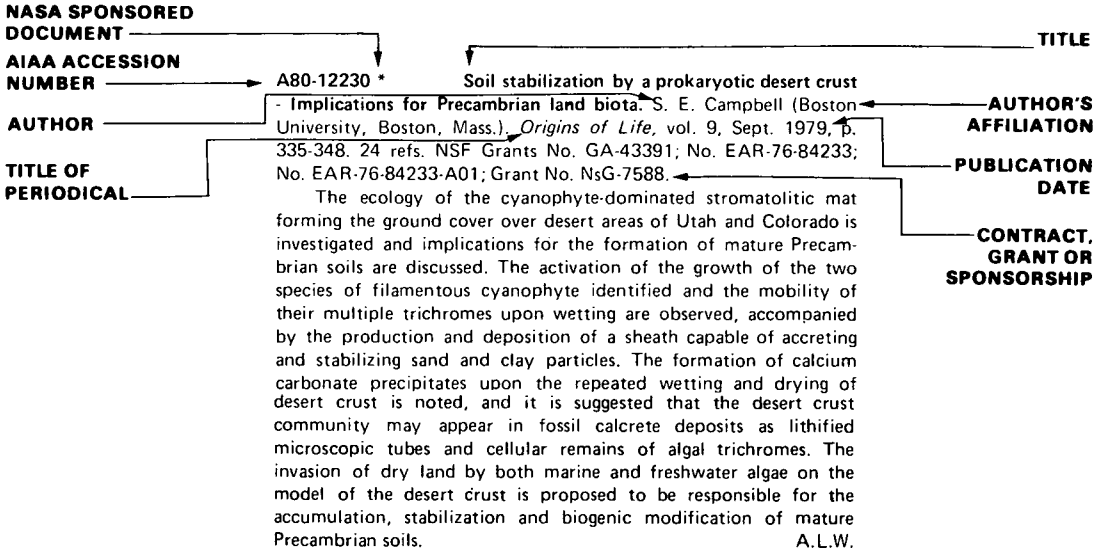

AEROSPACE MEDICINE AND BIOLOGY

A Continuing Bibliography (Suppl. 208)

JULY 1980

IAA ENTRIES

A80-29085 * Favorable effects of the antioxidants sodium and magnesium thiazolidine carboxylate on the vitality and life span of Drosophila and mice. J. Miquel (NASA, Ames Research Center, Moffett Field, Calif.) and A. C. Economos (San Jose State University, San Jose, Calif.). *Experimental Gerontology,* vol. 14, 1979, p. 279-285. 30 refs.

A80-29178 Compensation for distortion in eye-movement monitors. F. Karpala and M. E. Jernigan (Waterloo, University, Waterloo, Ontario, Canada). *IEEE Transactions on Biomedical Engineering,* vol. BME-27, Mar. 1980, p. 113-119. 12 refs. National Research Council of Canada Grants No. 079-6396; No. 079-6125.

A compensation scheme for the correction of both horizontal and vertical eye position measurements is developed. Based on the assumption that the distortion process can be modeled as piecewise linear, a new sample point structure is introduced. This structure permits both fixation-based and tracking-based sampling strategies. It also provides a convenient method for partitioning a display for estimation purposes. A minimum mean squared error estimate for the regional linear functions is derived. The problem of measurement assignment to linear regions is solved using a weighted distance metric. Performance is given both in terms of estimation error and the error remaining after correction for a test pattern. Results are presented for a specific example. (Author)

A80-29179 Significance of blood flow in calculations of temperature in laser irradiated tissue. A. J. Welch, E. H. Wissler (Texas, University, Austin, Tex.), and L. A. Priebe (Texas Instruments, Inc., Dallas, Tex.). *IEEE Transactions on Biomedical Engineering,* vol. BME-27, Mar. 1980, p. 164-166. 6 refs. Research supported by the University of Texas; Contract No. F41609-76-0605.

A dimensionless solution of the heat conduction equation for laser irradiation of tissue has been extended to include transport of heat owing to blood flow. The importance of the heat loss term is discussed in relation to the perfusion rate and exposure duration. (Author)

A80-29359 Use of double pulse holography for vibration analysis on a human ear in vivo (Einsatz der Doppelimpuls-Holografie für die Schwingungsanalyse am Trommelfell des lebenden Menschen). H. Kreitlow, M.-A. Beeck (Hannover, Technische Universität, Hanover, West Germany), and W. Fritze (HNO-Klinik, Vienna, Austria). In: Laser 79 opto-electronics; Proceedings of the Fourth Conference, Munich, West Germany, July 2-6, 1979. Guildford, Surrey, England, IPC Science and Technology Press, Ltd., 1979, p. 221-227. 10 refs. In German.

The paper describes the use of a giant-pulse ruby laser, a holographic interferometer, and an electronic control system to measure the vibrations of the human eardrum. Attention is given to the use of an otoscope with a built in fiber-optic cable which guides the object wave to the hologram plate by means of a built-in lens system. M.E.P.

A80-29421 The representation of colours in the cerebral cortex. S. Zeki (University College, London, England). *Nature,* vol. 284, Apr. 3, 1980, p. 412-418. 26 refs. Research supported by the Science Research Council.

The role of the cerebral cortex in color perception and the ways in which color is represented there are investigated. Wavelength response curves of isolated cells from the fourth visual areas of rhesus monkeys indicate that the cells can be selective for narrow parts of the visible spectrum (bandwidth of 10 to 50 nm) covering almost the entire visible spectrum, with clusterings at 480 nm (blue), 500 nm (green) and 620 nm (orange-red), and in the purple. Oblique penetrations of the visual cortex reveal the orderly grouping together of cells with particular color preferences. A multi-colored Mondrian display was then placed in the visual field so that only one square of the pattern covered the receptive field of a color-coded cell, and the response of the cell was monitored as a function of the wavelength of light illuminating the entire display. Cells are found to respond actively to their specific color only when illuminated by all three (red, blue and green) wavelengths. Cell responses are also shown to be correlated with the color of the display rather than the relative intensities of short-, middle-, and long-wavelength radiation reaching the eye, implying that for the single cell as well as in perception, the composition of light in terms of energy-wavelength relationships may be of little importance. A.L.W.

A80-29676 Noninvasive access to cardiovascular dynamics: Experimental and applied; Proceedings of the Eleventh European Congress on Ballistocardiography, Noninvasive Cardiography, and Cardiovascular Dynamics, Univerza v Ljubljani, Ljubljana, Yugoslavia, March 20-22, 1978. Congress sponsored by the Research Community of Slovenia, Health Community of Slovenia, Univerza v Ljubljani, and Committee of Health of Slovenia. Edited by G. Juznic (Ljubljana, Univerza, Ljubljana, Yugoslavia). Basel, S. Karger AG (Bibliotheca Cardiologica, No. 37) 1979. 239 p. $84.50.

Papers are presented on noninvasive means of studying cardiovascular dynamics by the use of ballistocardiography, mechanocardiography sphygmocardiography, rheocardiography, echocardiography, nuclear medicine techniques, radar kymography, systolic time interval techniques and transfer functions. Specific topics include the history and present status of ballistocardiography, the past and present of kinetocardiography, the clinical application of carotid electrosphygmography, heart beat recording by ultralow frequency and direct body methods, echocardiography in the assessment of the severity of mitral stenois, the polycardiographic study of cardiac dynamics during work, the pulse contour method in the determination of cardiac output, the effects of fiber orientation on the modeling of ventricular power generation, and the dynamic characteristics of the thorax. A.L.W.

A80-29677 **Ballistocardiography - Past, present and future.** W. J. A. Goedhard (Amsterdam, Vrije Universiteit, Amsterdam, Netherlands). In: Noninvasive access to cardiovascular dynamics: Experimental and applied; Proceedings of the Eleventh European Congress on Ballistocardiography, Noninvasive Cardiography and Cardiovascular Dynamics, Ljubljana, Yugoslavia, March 20-22, 1978. Basel, S. Karger AG, 1979, p. 27-45. 21 refs.

The physiological basis, techniques and possible applications of the noninvasive technique of ballistocardiography in its present state of development are discussed. Preliminary results of experiments investigating the relation of two-dimensional ballistocardiography to aortic flow rate show that the transfer function between them is not a constant under all circumstances, indicating that further research is required to determine the parameters influencing the ballistocardiography signal. Techniques for recording signals in one, two or three dimensions exist and allow investigations of various levels of complexity. The analysis of the signals obtained, however, has not been standardized, although the amplitude of IJ in acceleration ballistocardiography in the head-foot orientation and the comparison of traces obtained with those of a healthy subject by computerized cross-correlation analysis are possible approaches. Despite these problems, it is concluded that research on ballistocardiography should be continued due to its potential in the early diagnosis of coronary heart disease and in clinical medicine. A.L.W.

A80-29678 **Direct body ballistocardiography - A 25 year survey - Landmarks in its representation of cardiac dynamics.** N. J. Winer. In: Noninvasive access to cardiovascular dynamics: Experimental and applied; Proceedings of the Eleventh European Congress on Ballistocardiography, Noninvasive Cardiography and Cardiovascular Dynamics, Ljubljana, Yugoslavia, March 20-22, 1978. Basel, S. Karger AG, 1979, p. 46-57; Discussion, p. 57. 13 refs.

The direct body BCG (Ballistocardiogram) has been shown to reflect various expressions of the known physiological principles of cardiac dynamics. Emphasis has been placed on the identification and characteristics of the individual segment rather than on gross pattern variability for proper BCG pattern evaluation. Its sensitivity in the detection of early myocardial infarction with particular attention to its initial HI forces has been described. The significance of the simple Master two-step test (double) in eliciting the amplification or deterioration of these forces as a measure of myocardial integrity has also been emphasized. With this proposed definitive direction, there is call for widely organized attempts to clarify its potential as an important adjuvant in the study of clinical heart disease. (Author)

A80-29679 **Kinetocardiography - Past and present.** W. H. Bancroft, Jr. (U.S. Veterans Administration Hospital, Birmingham, Ala.). In: Noninvasive access to cardiovascular dynamics: Experimental and applied; Proceedings of the Eleventh European Congress on Ballistocardiography, Noninvasive Cardiography and Cardiovascular Dynamics, Ljubljana, Yugoslavia, March 20-22, 1978. Basel, S. Karger AG, 1979, p. 58-71; Discussion, p. 72. 10 refs.

Past research in and the present status of the noninvasive technique of kinetocardiography, which involves the recording of the absolute displacement of several points of the precordium, in the diagnosis of heart disease are discussed. Equipment used in the recording of kinetocardiograms is described, and a normal kinetocardiogram is presented. The evaluation of kinetocardiography data by computer processing is discussed, and it is noted that amplitude and time normalization make averaging of the curves obtained more meaningful for the comparison of normal and abnormal kinetocardiograms. It is shown that the technique can discriminate between various severities of coronary artery disease and can also be used to monitor changes in the same subject prior to and following coronary artery surgery. It is concluded that the most promising areas for the use of kinetocardiography appear to be the evaluation of coronary artery bypass surgery and the extent of dyskinesis, however support for research in this area must be continued. A.L.W.

A80-29680 **Clinical application of carotid electrosphygmography.** H. Chlebus (Akademia Medyczna, Warsaw, Poland). In: Noninvasive access to cardiovascular dynamics: Experimental and applied; Proceedings of the Eleventh European Congress on Ballistocardiography, Noninvasive Cardiography and Cardiovascular Dynamics, Ljubljana, Yugoslavia, March 20-22, 1978.
Basel, S. Karger AG, 1979, p. 73-82; Discussion, p. 82, 83. 10 refs.

Consideration is given to the clinical applications of sphygmography, the graphic measurement of the pulse. The history of the graphic representation of the pulse is briefly discussed, and the contour of the arterial pulse wave and its relation to the characteristics of blood flow and arterial distensibility are examined. Experimental studies of the application of carotid resonance electrosphygmography to the determination of arterial distensibility and the assessment of arterial degeneration are presented, including an evaluation of carotid arteriograms, aortic pulse wave velocity and the left ventricular systolic time intervals. It is reported that a significant correlation between pulse wave velocity as determined by X-ray aortography and quantitative sphygmographic data was found. It is concluded that carotid resonance electrosphygmography represents a useful noninvasive method for the quantitative evaluation of arterial damage, especially in the cases of atherosclerosis and hypertension. A.L.W.

A80-29681 **Genesis of the sphygmogram from the kinetocardiogram.** G. Juznic (Ljubljana, Univerza, Ljubljana, Yugoslavia). In: Noninvasive access to cardiovascular dynamics: Experimental and applied; Proceedings of the Eleventh European Congress on Ballistocardiography, Noninvasive Cardiography and Cardiovascular Dynamics, Ljubljana, Yugoslavia, March 20-22, 1978.
Basel, S. Karger AG, 1979, p. 84-107; Discussion, P. 107, 108. 39 refs. Research supported by the Boris Kidric Fund.

The relationship between the carotid sphygmogram and the kinetocardiogram is investigated in terms of the functional uniformity of the cardiovascular system. The displacements of the chest wall and carotid artery of 10 healthy young adults were determined using photoelectric and resonance receiver transducers placed on the thorax and the amplitude and time intervals at rest and under the influence of catecholamines were analyzed. Results demonstrate the genesis of the sphygmogram from the kinetogram by the propagation of the deformation initiated at the aorta to the apex, where it is reflected and directed to the carotid artery. It is also concluded that the measurement of reflection wave and pulse wave velocities can be used as a test of the reactivity of an individual's cardiovascular system to stress and thus indicate a predisposition to coronary disease. A.L.W.

A80-29682 **Sphygmographic assessment of arterial distensibility in patients at risk of degenerative arterial disease.** H. Chlebus, J. Waclawek and M. Ciswicka-Sznajderman (Akademia Medyczna, Warsaw, Poland). In: Noninvasive access to cardiovascular dynamics: Experimental and applied; Proceedings of the Eleventh European Congress on Ballistocardiography, Noninvasive Cardiography and Cardiovascular Dynamics, Ljubljana, Yugoslavia, March 20-22, 1978. Basel, S. Karger AG, 1979, p. 154-158. 5 refs.

Evidence indicates that the pattern of central pulse waveform is related to the pulse wave velocity (PWV) and expresses the distensibility of the aorta and its large branches. Investigations have shown that carotid resonance electrosphygmograms (CRESGs) reflect true central arterial pressure oscillations; their features have been qualified as quantitative criteria of the functional assessment of the mechanical properties of the arteries. Vascular ageing, atherosclerosis, structural damage to the arterial wall in consequence of hypertension, and the elevated blood pressure itself, represent the most frequent causes of decreased arterial distensibility. The studies presented were carried out to evaluate the development of arterial degeneration and sclerosis in the course of primary hyperlipoproteinaemias and primary arterial hypertension. (Author)

A80-29683 **Comparative examination of the pulse of both right and left carotid arteries.** H. Chlebus and J. Raczynski

(Akademia Medyczna, Warsaw, Poland). In: Noninvasive access to cardiovascular dynamics: Experimental and applied; Proceedings of the Eleventh European Congress on Ballistocardiography, Noninvasive Cardiography and Cardiovascular Dynamics, Ljubljana, Yugoslavia, March 20-22, 1978. Basel, S. Karger AG, 1979, p. 159-163.

Recent advances in sphygmography, in the registration, description, measurement and interpretation of the contour of the central arterial pulse wave, provides facilities for a wider clinical application of this noninvasive method to quantitative assessment of arterial dynamics. The abnormal features of carotid resonance electrosphygmograms have been defined as quantitative criteria of reduced arterial distensiblity. Deformation of the tracings may depend on the severity and extensiveness of degenerative lesions and on their distance from the point of examination. Simultaneous records of the pulse of both right and left carotid arteries would help to differentiate the influence of local and distant arterial lesions on the contour of the tracings. Remote influences might give rather similar, symmetric deformation of the contour of both arteriograms.

(Author)

A80-29684 Evaluation of the pulse contour method in beat-to-beat determination of the cardiac output in small laboratory animals. S. Nikolic, D. Susic, and D. Kentera (Institute for Medical Research, Belgrade, Yugoslavia). In: Noninvasive access to cardiovascular dynamics: Experimental and applied; Proceedings of the Eleventh European Congress on Ballistocardiography, Noninvasive Cardiography and Cardiovascular Dynamics, Ljubljana, Yugoslavia, March 20-22, 1978. Basel, S. Karger AG, 1979, p. 169-173. 7 refs.

A80-29685 Influence of diastolic fibre orientation on the left ventricular power generation. V. Starc (Ljubljana, Univerza, Ljubljana, Yugoslavia). In: Noninvasive access to cardiovascular dynamics: Experimental and applied; Proceedings of the Eleventh European Congress on Ballistocardiography, Noninvasive Cardiography and Cardiovascular Dynamics, Ljubljana, Yugoslavia, March 20-22, 1978. Basel, S. Karger AG, 1979, p. 174-179. 9 refs.

A mathematical model of power generation in the left ventricle which takes into account myocardial muscle fiber orientations is presented. The model approximates the left ventricle as a thin spherical shell obeying the law of Laplace, with a myocardium composed of helically wound muscle fibers consisting of serially connected contractile elements of equal length and the shape of the ventricle remaining constant at various diastolic volumes. It thus implies that an increase in end-diastolic volume is accompanied by an increase in fiber length, as well as an alteration in the helix parameter and the density of contractile elements. Power generated by the heart wall is thus represented as a product of the average contractile element density, a form factor of the ventricle, and the power of a single contractile element. A.L.W.

A80-29686 Dynamic characteristics of the thorax connected with the heart action. G. Juznic, I. Emri, D. Peterec, and M. Prepadnik (Ljubljana, Univerza, Ljubljana, Yugoslavia). In: Noninvasive access to cardiovascular dynamics: Experimental and applied; Proceedings of the Eleventh European Congress on Ballistocardiography, Noninvasive Cardiography and Cardiovascular Dynamics, Ljubljana, Yugoslavia, March 20-22, 1978.
Basel, S. Karger AG, 1979, p. 180-194; Discussion, p. 194. 23 refs. Research supported by the Boris Kidric Fund.

The dynamic characteristics of thoracic motion are investigated as functions of subject somatotypae and respiratory position in order to provide a basis for the quantitative use of noninvasive methods for studying cardiovascular functions. A reflex hammer was used to apply shocks with a force of 2 N to 88 costal and intercostal points of the thorax, and the resonance frequency, damping coefficient, stiffness constant extinction time and transfer functions of different parts of the thorax were determined on the basis of accelerometer and seismocardiophone observations. It is found that the leptosome has high damping and a short extinction time, while the athletic type has a high resonance frequency and a high stiffness constant and the pyknic type has the lowest damping, resonance frequency and stiffness constant and the highest oscillating time. The lowering of intrathoracic pressure is observed to lead to higher damping in the costal points and a higher resonance frequency and stiffness constant in the intercostal points. Transfer functions are shown to be greatest in the pyknic type and depend on respiratory position. It is concluded that the brief testing of thoracic dynamic characteristics will facilitate the quantitative use of noninvasive methods in the evaluation of cardiovascular function. A.L.W.

A80-29687 Further observations on modelling of the cardiovascular function in the electrical model. G. Juznic, D. Peterec, and A. Jagodic (Ljubljana, Univerza, Ljubljana, Yugoslavia). In: Noninvasive access to cardiovascular dynamics: Experimental and applied; Proceedings of the Eleventh European Congress on Ballistocardiography, Noninvasive Cardiography and Cardiovascular Dynamics, Ljubljana, Yugoslavia, March 20-22, 1978.
Basel, S. Karger AG, 1979, p. 195-208. 17 refs. Research supported by the Boris Kidric Fund.

A80-29909 # Investigation of transitional characteristics of the equilibrium preservation system (Issledovanie perekhodnykh kharakteristik sistemy sokhraneniia ravnovesiia). G. V. Mamasakhlisov (Tbilisskii Gosudarstvennyi Universitet, Tiflis, Georgian SSR). *Akademiia Nauk Gruzinskoi SSR, Soobshcheniia,* vol. 96, Nov. 1979, p. 433-436. 7 refs. In Russian.

An investigation is presented of the transitional characteristics of the human equilibrium preservation system. The electromyographic, kinematic, and dynamic indices of the motor apparatus during the disturbance of the human vertical posture caused by the acceleration of the supporting platform are analyzed. It is shown that muscular responses to a disturbed vertical posture do not constitute a simple sequel to the extension reflex; the possible mechanisms are discussed with reference to a central program of equilibrium preservation. A.T.

A80-30342 The identification of the 3-micron spectral feature in galactic infrared sources. F. Hoyle and C. Wickramasinghe (University College, Cardiff, Wales). *Astrophysics and Space Science,* vol. 68, no. 2, Apr. 1980, p. 499-503. 8 refs.

It is shown that a 3-micron extinction feature in galactic infrared sources cannot be due to water-ice grains. Infrared spectra with a resolution of Delta lambda/lambda = 0.015 are in remarkably close agreement with the 2.5-4 micron extinction properties calculated for bacterial grains. (Author)

A80-30434 # Cardiac output at high altitude (Rabota serdtsa v usloviiakh vysokogor'ia). S. B. Daniiarov. Leningrad, Izdatel'stvo Medizina, 1979. 152 p. 313 refs. In Russian.

Contemporary literature concerning the functioning of the heart at high altitudes is reviewed. Attention is given to the hemodynamic indicators of heart function under conditions of hypoxic hypoxia, changes in the contractile activity of the heart at high altitude, the dynamics of left ventricular papillary muscle contraction during altitude adaptation, and changes in myocardial structure and metabolism under altitude-induced hypoxic hypoxia. Results of extensive experiments on the characterization of the injection function of the heart during altitude acclimatization are also analyzed. A.L.W.

A80-30455 # Visual learning and interhemispherical interaction (Zritel'noe obuchenie i mezhpolusharivoe vzaimodeistvie). M. A. Makashvili (Akademiia Nauk Gruzinskoi SSR, Institut Fiziologii, Tiflis, Georgian SSR). *Akademiia Nauk Gruzinskoi SSR, Soobshcheniia,* vol. 96, Dec. 1979, p. 685-688. 9 refs. In Russian.

An attempt was made to study whether the corpus callosium has an influence on the conditional reflex behavior of cats. The experiments were carried out with control cats and cats with midline

dissection of the corpus callosium. Using diffuse-light-intensity and other more complex stimuli, it was found that interhemispherical interaction of the visual analysor is indispensible for perception and processing of visual information. V.P.

A80-30456 # **Changes in the rhythmicity of the cerebral bioelectric potentials of head-shielded rabbits subjected to roentgen irradiation of the body in the minimum lethal dose (Izmeneniia ritmiki biopotentsialov mozga krolikov pri rentgenovskom obluchenii tulovishcha v minimal'no smertel'noi doze v usloviiakh ekranirovaniia golovy).** G. V. Feigin (Akademiia Nauk Gruzinskoi SSR, Institut Fiziologii, Tiflis, Georgian SSR). *Akademiia Nauk Gruzinskoi SSR, Soobshcheniia,* vol. 96, Dec. 1979, p. 701-704. In Russian.

A80-30457 # **Fermentative activity of neutrophil leukocytes in rats under conditions of hypoxic hypoxia (Fermentativnaia aktivnost' neitrofil'nykh leikotsitov krys pri gipoksicheskoi gipoksii).** E. S. Chertkova (Akademiia Nauk Gruzinskoi SSR, Institut Eksperimental'noi Morfologii, Tiflis, Georgian SSR). *Akademiia Nauk Gruzinskoi SSR, Soobshcheniia,* vol. 96, Dec. 1979, p. 721-724. In Russian.

A80-30513 # **Medical research work onboard the Soyuz 30-Salyut 6 orbital laboratory (Badania medyczne w kompleksie orbitalnym 'Sojuz 30-Salut 6').** S. Baranski, R. Bloszczynski, M. Hermaszewski, J. Kubiczkowa, A. Piorko, R. Saganiak, Z. Sarol, F. Skibniewski, J. Stendera, and W. Walichnowski (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland). *Postepy Astronautyki,* vol. 12, no. 4, 1979, p. 9-20. In Polish.

The paper deals with medical aspects of a spaceflight involving the Soviet cosmonaut Klimuk and his Polish crew member Hermaszewski. Studies of the cardiovascular system are described, placing emphasis on the tests carried out on the third day in space. The physical exercises, protective measures, and the nutrition and hygienic aspects of the space flight are discussed. V.P.

A80-30514 # **Procedures and facilities for studying the capacity for work of cosmonauts (Metoda i aparatura do badania zdolnosci wysilkowej kosmonautow).** S. Baranski, R. Bloszczynski, M. Hermaszewski, J. Kubiczkowa, A. Piorko, R. Saganiak, Z. Sarol, F. Skibniewski, J. Stendera, and W. Walichnowski (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland). *Postepy Astronautyki,* vol. 12, no. 4, 1979, p. 21-42. In Polish.

The paper deals with tests carried out to check the performance level of the Polish astronaut Hermaszewski prior to and after a space flight. The tests were carried out by a newly developed procedure consisting of determining the quantity of work performed during periods of a few minutes under conditions of cardiovascular equilibrium, regulated by the feedback principle between the heart rate and the cycloergometer load. The block and circuit diagrams of the respective facilities are given and discussed. V.P.

A80-30515 # **Use of a cardioleader to monitor the heart rate of cosmonauts during physical exercises and under conditions of a low-pressure suit onboard Salyut 6 (Zastosowanie kardiolidera do kontroli czynnosci serca kosmonauty podczas treningu fizycznego oraz w ubiorze podciznieniowym w stacji orbitalnej 'Salut 6').** S. Baranski, R. Bloszczynski, M. Hermaszewski, J. Kubiczkowa, A. Piorko, R. Saganiak, Z. Sarol, F. Skibniewski, J. Stendera, and W. Walichnowski (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland). *Postepy Astronautyki,* vol. 12, no. 4, 1979, p. 43-50. In Polish.

The paper deals with tests carried out on the Polish cosmonaut Hermaszewski to study the influence of weightlessness on physical activity. An apparatus with threshold alarm devices ('cardioleader') developed to monitor the heart rate is described. V.P.

A80-30516 # **Electrogustometric studies in orbital flight (Badania elektrogustometryczne w locie orbitalnym).** S. Baranski, R. Bloszczynski, M. Hermaszewski, J. Kubiczkowa, A. Piorko, R. Saganiak, Z. Sarol, F. Skibniewski, J. Stendera, and W. Walichnowski (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland). *Postepy Astronautyki,* vol. 12, no. 4, 1979, p. 51-60. 15 refs. In Polish.

The specifications of an electrogustometer adapted to operate in a space environment are given, along with the specifications of the set of electrodes. The block and digital circuit diagrams of the device are discussed. Some results of an investigation of the taste perception thresholds of a Polish cosmonaut, prior to and during space flight are examined. V.P.

A80-30517 # **Observation of the vestibular function during space flight (Obserwacja czynnosci narzadow przedsionkowych podczas lotu kosmicznego).** S. Baranski, R. Bloszczynski, M. Hermaszewski, J. Kubiczkowa, A. Piorko, R. Saganiak, Z. Sarol, F. Skibniewski, J. Stendera, and W. Walichnowski (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland). *Postepy Astronautyki,* vol. 12, no. 4, 1979, p. 61-74. 23 refs. In Polish.

Equilibrium disturbances induced by zero gravity manifest themselves as vestibular disorders, motion sickness, and spatial illusions. In the present paper, these disorders are studied in the light of available findings on United States astronauts and some results of studies conducted on a Polish cosmonaut during and after a space flight. Some possible mechanisms of the space-induced disorders are examined. V.P.

A80-30518 # **Determination of oxygen tension in the subcutaneous tissue of cosmonauts during the Salyut-6 mission (Oznaczenie cisnienia czastkowego tlenu w tkance podskornej kosmonautow podczas lotu w stacji kosmicznej 'Salut 6').** S. Baranski, R. Bloszczynski, M. Hermaszewski, J. Kubiczkowa, A. Piorko, R. Saganiak, Z. Sarol, F. Skibniewski, J. Stendera, and W. Walichnowski (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland). *Postepy Astronautyki,* vol. 12, no. 4, 1979, p. 75-80. In Polish.

A polarographic technique was used to measure the oxygen tension in subcutaneous tissue of the forearm of cosmonaut Hermaszewski prior to, after, and on the fourth day of a space mission. A drop in the oxygen exchange rate in the peripheral tissues during weightlessness was observed. The mechanisms of this change are studied, taking into consideration the blood distribution in the organism and microcirculation disorders reflected by a decreased blood flow rate in arterial-venous junctions. V.P.

A80-30520 # **The psychological experiments 'Self-interrogation' and 'Relaxation' (Eksperymenty psychologiczne 'Samoocena' i 'Relaks').** S. Baranski, R. Bloszczynski, M. Hermaszewski, J. Kubiczkowa, A. Piorko, R. Saganiak, Z. Sarol, F. Skibniewski, J. Stendera, and W. Walichnowski (Wojskowy Instytut Medycyny Lotniczej, Warsaw, Poland). *Postepy Astronautyki,* vol. 12, no. 4, 1979, p. 85-101. 11 refs. In Polish.

The paper deals with physiological tests performed on cosmonaut Hermaszewski to evaluate his ability to function in space and his adaptation to the space environment. His ability to cope with sensory and social deprivation, psychological stress, and other space factors is attributed to his excellent physical, functional, and emotional state, the comradeship with his Soviet crew member, the motivation of performing difficult but honorable functions, and last but not least to thorough preflight training in which a special recreation program, termed Relaxation, played an important part. V.P.

A80-30673 MTF of the defocused optical system of the human eye for incoherent monochromatic light. L. J. Bour (Utrecht, Rijksuniversiteit, Utrecht, Netherlands). *Optical Society of America, Journal,* vol. 70, Mar. 1980, p. 321-328. 19 refs. Research supported by the Nederlandse Organisatie voor Zuiver-Wetenschappelijk Onderzoek.

A psychophysical method has been used to measure the modulation transfer function (MTF) of the defocused optical system of the human eye for incoherent monochromatic light (514 nm) and for various pupil diameters. The results have been compared with theoretical calculations based on aberration coefficients found

previously. MTF's have been computed for white light with the help of the measurements obtained for monochromatic light. (Author)

A80-30674 Flicker-induced asymmetries in border enhancement and the distinction between brightness and darkness systems. A. Remole (Waterloo, University, Waterloo, Ontario, Canada). *Optical Society of America, Journal,* vol. 70, Mar. 1980, p. 329-334. 21 refs. Natural Sciences and Engineering Research Council of Canada Grant No. A-9951.

Border enhancement is observed in a flickering bright-dark field. It is found that both the dark and the bright portions of the enhanced region increase in extent from the border during certain flicker frequencies, but not symmetrically about the border. This asymmetry is described by plotting the ratio of the dark and bright enhanced regions against stimulus frequency. The ratio fluctuates with frequency, the amplitude of the fluctuations being greatest at low frequencies. The foveal region stimulated by the border has some effect on the ratio functions. They cannot be mimicked by ratios obtained from enhancement responses to low and high luminances on either the dark or bright side of the border. It is suggested that these flicker-induced asymmetries are best understood in the context of separate neural systems for the perception of darkness and brightness. (Author)

A80-30813 A psychoacoustic study of impulsive helicopter noise (Etude psycho-acoustique des bruits impulsifs d'hélicoptères). A. Damongeot (Société Nationale Industrielle Aérospatiale, Marignane, Bouches-du-Rhône, France). *(Colloque Acoustique-Aérodynamique, 6th, Paris, France, May 29-31, 1978.) Revue d'Acoustique,* vol. 12, no. 48, 1979, p. 60-69. 7 refs. In French. Research sponsored by the Direction Technique des Constructions Aéronautiques and Ministère de la Culture et de l'Environnement.

The degree of annoyance caused by the intensity and impulsiveness of impulsive helicopter noise is investigated. Pairwise comparisons of the relative annoyance provoked by an identical impulsive helicopter noise and various intensities of a nonimpulsive helicopter noise were made by 20 juries comprising a total of 116 subjects. Results indicate that the units presently in use for quantifying annoyance (dBA, TPNdB, PNdB and EPNdB) do not completely represent the levels brought about by impulsive noise; these values must be corrected upwards by up to 6 units to reach the equivalent effects of continuous noise. An impulsivity indicator derived from the variance of the sound pressure is then introduced as a correcting factor in the establishment of helicopter noise certification standards, and it is shown to account well for the observed results.

A.L.W.

A80-30815 The psychoacoustic effects of aircraft noise on sleep - An in situ study (Les effets psycho-acoustiques des bruits d'avion sur le sommeil - Etude in situ). M. Vallet, F. Simonnet (Institut de Recherche des Transports, Arcueil, Val-de-Marne, France), and J. M. Gagneux (Association de Recherche, Pollution, Environnement et Nuissance, France). *(Colloque Acoustique-Aérodynamique, 6th, Paris, France, May 29-31, 1978.) Revue d'Acoustique,* vol. 12, no. 48, 1979, p. 79-81. 7 refs. In French.

The quality of sleep of persons living near an airport which is open at night is investigated, and results of the in situ studies are compared with those obtained in the laboratory reviewed by Lukas (1975) and Griefahn (1976). The sleep patterns of 40 men between the ages of 20 and 55 living in zones of various noise exposure surrounding Roissy airport for a year were monitored during four consecutive nights by EEG, EOG, EMG and EKG. The frequencies of awakenings and sleep-stage variations in the presence of aircraft noise observed in situ are found to be lower than in the reported laboratory tests, indicating an adaptation to the noise in habituated sleepers, and to increase very slowly with increasing noise level. Responses to aircraft noise are also observed to depend on the number of flights on a given night, with reaction rate increasing to a level where it stabilizes, however even at the lowest noise levels, no zero-responses were observed. A.L.W.

A80-30854 An investigation of the effects of impulse noise exposure on man - Impulse noise with a relatively low peak level. K. Yamamura, S. Hiramatsu, T. Hikichi, S. Hiramatsu (Sapporo Medical College, Sapporo, Japan), and K. Aoshima (Toyama Medical and Pharmaceutical University, Toyama, Japan). *European Journal of Applied Physiology,* vol. 43, Mar. 1980, p. 135-142. 14 refs. Research supported by the Environmental Agency of Japan.

The effects of impulse noise of a relatively low peak level were examined to develop damage risk criteria for impulse noise. Eight to 13 normal male students (aged 20-24 years) were exposed to impulse noise. Peak levels of impulse noise were 100 dB and 105 dB, B-duration of impulse noise being 10 ms, 50 ms, and 100 ms, and the repetition rates of impulse noise were 3 per 1 s and 1 per 3 s. Exposure time was 8 h. Exposure conditions of long B-duration induced greater TTS2 than those of short B-duration (P less than 0.05). Impulse noise exposure at a high peak level induced slightly larger TTS2 than that at a low peak level. TTS2 increased proportionally to the logarithm of the amount of impulse noise. Exposure to impulse noise induced smaller TTS2 than that of steady-state noise of an equal energy level. Exposure to large amounts of impulse noise induced slightly greater urinary 17 OHCS levels than small amounts of impulse noise, and exposure to impulse noise induced smaller urinary 17 OHCS levels than steady-state noise of an equal energy level. The decreasing effect of the acoustic reflex on the acoustic energy of impulse noise was considered to be the reason for the results obtained. (Author)

A80-30873 Diagnostic accuracy of the conventional 12-lead and the orthogonal Frank-lead electrocardiograms in detection of myocardial infarctions with classifiers using continuous and Bernoulli features. U. Jain and P. M. Rautaharju (Dalhousie University, Halifax, Canada). *Journal of Electrocardiology,* vol. 13, Apr. 1980, p. 159-166. 22 refs. Research supported by the Medical Research Council of Canada and Nova Scotia Heart Foundation; Department of National Health and Welfare of Canada Grants No. 603-1052-45; No. 6603-20-10-45.

The present investigation evaluates the possibility of using a decision-theoretic classifier and a set of ECG features which are discretized to obtain Bernoulli variables, and compares the diagnostic accuracy of the 12-lead and Frank-lead ECG in detecting myocardial infarctions. The branch-and-bound algorithm, the sequential forward selection and backward rejection procedures are used for selecting the best subsets of Bernoulli and continuous features out of the primary set of features measured from the 12-lead and Frank-lead ECG. The classification accuracy of Bernoulli and continuous features is estimated in a test library composed of ECGs of 237 subjects with old myocardial infarcts and 299 subjects without infarction. It is concluded that while Bernoulli variables perform as well as or better than continuous variables over a wide range of sensitivity and specificity, continuous features appear to yield a higher diagnostic accuracy when a high level of specificity is required. The information content of the 12-lead ECG appears as good as or better than that of the Frank-lead ECG. S.D.

A80-31075 # Role of thyroxin in the thermoregulation of albino rats following cold acclimation (O roli tiroksina v termoreguliatsii belykh krys posle aklimatsii k kholodu). V. I. Sobolev (Donetskii Gosudarstvennyi Universitet, Donetsk, Ukrainian SSR). *Fiziologicheskii Zhurnal SSSR,* vol. 66, Feb. 1980, p. 268-273. 14 refs. In Russian.

A80-31446 Influence of microwave irradiation on the resistance of rats to transversely applied g forces. V. S. Tikhonchuk. *(Kosmicheskie Issledovaniia,* vol. 17, July-Aug. 1979, p. 636-638.) *Cosmic Research,* vol. 17, no. 4, Jan. 1980, p. 525-527. 6 refs. Translation.

A80-31480 # Vibration of the basilar membrane in the mammalian cochlea (O kolebanii baziliarnoi membrany vo vnutrennem ukhe mlekopitaiushchikh). V. M. Babich and S. M. Novoselova.

In: Mathematical problems of the theory of wave propagation. 10. Leningrad, Izdatel'stvo Nauka, 1979, p. 54-62. 32 refs. In Russian.

The cochlea is modeled as a hydromechanical waveguide with smoothly varying properties along whose midsection an elastic anisotropic plate - the basilar membrane - is located. A WKB type method is used to investigate the displacement of the membrane. The results are presented in graphical form and discussed in detail. B.J.

A80-31584 # **Liquid conditioned suit and its use in alleviating heat stress in military flying.** P. K. Bannerjee, M. K. Vyawahare, C. A. Verghese, and J. S. Sant (Indian Air Force, Institute of Aviation Medicine, Bangalore, India). *Aviation Medicine,* vol. 23, Dec. 1979, p. 79-84. 11 refs.

Efforts are now being made to develop suitable cooling packs for aircrews, which will be compatible with the space, weight and power provision of an aircraft. The paper deals with two such systems: (1) Model 1, a laboratory model of freon package; and (2) Model 2, a miniaturized insulated ice package. The objective was to study their suitability in alleviating the heat load that is commonly prevalent in low-level flying in tropical summer. Nine healthy male volunteers participated in the study. The first model of the refrigerant pack for laboratory trials on liquid-conditioned suit derives its cooling from the conventional freon refrigeration; the second model derives its cooling from fusion of ice and gradual temperature rise of water thus formed. The effectiveness of these two systems is evaluated in terms of reduction in physiological strain. S.D.

A80-31585 # **An evaluation protocol for fighter aircrew with non specific ST-T abnormalities.** M. M. Singh, K. Rai, S. K. Adaval (Indian Air Force, Institute of Aviation Medicine, Bangalore, India), M. Akhtar (Army Hospital, Delhi, India), and G. N. Kunzru. *Aviation Medicine,* vol. 23, Dec. 1979, p. 85-91. 26 refs. Research supported by the Indian Air Force. AFMRC Project 763/75.

Twenty aircrew members with asymptomatic nonspecific ECG abnormality were selected for this study. A detailed evaluation of such 'asymptomatic nonspecific ECG abnormality' with various stress tests available at 1 AM was carried out in order to establish and outline a standard program of evaluation for early diagnosis and disposal. ECGs were recorded at rest, in lying and standing positions, after Masters Double Two-step exercise, during and after submaximal and maximal treadmill exercise, during and after hyperventilation and Valsalva's maneuver, under hypoxia at rest and after Masters Double Two-step exercise, during tilt table studies and during/after +Gz stress. All the electrocardiographic studies were repeated after administration of propanolol as a beta blocker. S.D.

A80-31586 # **Aeromedical and physiologic aspects of fighter pilot selection and performance - Theoretical considerations.** J. E. Whinnery (USAF, School of Aerospace Medicine, Brooks AFB, Tex.). *Aviation Medicine,* vol. 23, Dec. 1979, p. 92-95. 16 refs.

Theoretical considerations are discussed regarding aeromedical and physiological aspects of fighter pilot selection and performance. The discussion focuses on definition of aerial combat stress, requisite for physical conditioning, and future trends. The recently introduced high-performance fighter aircraft produce a complex multistress environment with severe physiologic and psychologic demands placed on aircraft pilots. The etiology of loss of consciousness and loss of vision is due to lack of cerebral and retinal perfusion, respectively, resulting from the head-to-foot force of +Gz with a corresponding increased blood pooling in the lower extremities. Any condition which might predispose a pilot to an increased susceptibility to unconsciousness should be avoided. A final aspect of aircrewmen moving into a new higher stress environment is the possibility of exposure to a potentially hazardous environment. S.D.

A80-31588 # **Effects of alcohol on aircrew performance - A field study.** K. S. Soodan (Indian Air Force, Institute of Aviation Medicine, Bangalore, India). *Aviation Medicine,* vol. 23, Dec. 1979, p. 103-106.

Alcohol is known to affect the performance of individuals. The performance of 16 pilots has been studied 5 hr and 7 hr after the consumption of 3 oz of alcoholic drink on simulated flying task. The study revealed a decrease in the performance of the aircrew at the 5-hr stage. A decrement in performance of a lesser degree was present even at the 7-hr stage. (Author)

A80-31589 # **Dynamic vision under vibration and changes with curvature of transparencies.** M. K. Vyawahare, J. S. Sant, D. T. Shakunthala, and C. A. Verghese (Indian Air Force, Institute of Aviation Medicine, Bangalore, India). *Aviation Medicine,* vol. 23, Dec. 1979, p. 107-110. 14 refs.

Deterioration in dynamic visual acuity under low frequency vibration has been studied. Objects, moving with varying linear speeds in the range of 60-120 cm/sec. and having fixed contrast with the background, were presented to subjects. Threshold size of detection of moving objects show a significant change under vibration. Distortion and curvature in the viewing shield enhances the threshold size of objects. It is observed that low frequency vibration produces visual acuity decrement for static as well as dynamic objects. (Author)

A80-31590 # **Aeromedical evaluation of aircraft accidents - Human engineering aspects.** P. C. Sharda (Indian Air Force, Medical Services, New Delhi, India). *Aviation Medicine,* vol. 23, Dec. 1979, p. 113, 114.

Statistics continue to show an increased incidence of serious aircraft accidents where the cause has been attributed to human factors. In this paper, a few cases are selected to highlight various human engineering aspects probably operative in aircraft accident and injury causation. The discussion covers design deficiencies, modification and nonstandard aircraft, maintenance lapse, operational error, inadequacy in personal safety equipment, and aircrew-aircraft incompatibility in terms of anthropometric limitations. It is clear that certain factors do exist, but their respective role in accident or injury causation can only be conjectured. S.D.

A80-31591 # **Psycho-social aspects of aircraft accidents.** V. Kumar (AFCME, New Delhi, India). *Aviation Medicine,* vol. 23, Dec. 1979, p. 115-118. 9 refs.

The cause of human error in an aircraft accident can be determined by investigating the psychosocial aspects of the individual responsible for the accident. The paper discusses psychosocial factors relative to attention, emotional stability, motivation, experience, skill, self-esteem, fatigue, psychological stress and aircraft pilot, accident proneness, attitudes and flying, habit interference, crew behavior, man in a group, alcohol aftereffects and flying, as well as maintenance crew and air traffic control staff. Recommendations are made for reliably determining the cause of human error in an aircraft accident and for making psychosocial studies very meaningful. S.D.

A80-31592 # **Injury dynamics in aircraft accident.** R. Singh (Indian Air Force, Institute of Aviation Medicine, Bangalore, India). *Aviation Medicine,* vol. 23, Dec. 1979, p. 119-124. 8 refs.

The impact forces encountered in aircraft accidents are generally abrupt accelerations of short duration, usually less than 1 sec., thereby causing mechanical damage that results in injuries to aircraft occupants. The discussion covers human tolerance to abrupt accelerations, along with aircraft crash injuries and dynamics. The basic causes and mechanism of the injuries are discussed. For quick retrieval of information to correlate injuries with aircraft environment during crash, a supplementary form is suggested to be incorporated into the current Form MS 1956. S.D.

A80-31633 # **Determination and elimination of low-frequency zero-level oscillations of an EKG during automated processing (Otsenka i ustvanenie nizkochastotnykh kolebanii nulevogo urovnia EKG v protsesse avtomaticheskoi obrabotki).** Iu. V. Paramonov and N. E. Afanasenko (Akademiia Nauk SSSR, Institut Kibernetiki, Kiev, Ukrainian SSR). *Kibernetika i Vychislitel'naia Tekhnika,* no. 45, 1979, p. 32-39. 5 refs. In Russian.

An algorithm for eliminating zero-level noise oscillations in the processing of EKG data is presented. The procedure involves the use of the least squares method within the limit of a given P-T cycle. The effectiveness of the method is evaluated, and preliminary results of processing are discussed. B.J.

A80-31634 # **Complex statistical analysis of the detection of the QRS complex (Kompleksnaia statisticheskaia otsenka obnaruzheniia kompleksa QRS).** S. M. Makeev (Akademiia Nauk Ukrainskoi SSR, Institut Kibernetiki, Kiev, Ukrainian SSR) and A. G. Taranenko (Kievskii Institut Inzhenerov Grazhdanskoi Aviatsii, Kiev, Ukrainian SSR). *Kibernetika i Vychislitel'naia Tekhnika,* no. 45, 1979, p. 54-57. 7 refs. In Russian.

An algorithm for the recognition of the QRS complex and the R branch in the processing of EKG data is developed. Results of experimental verification of the algorithm are presented, and the computer implementation of the algorithm is discussed with reference to the automated processing of clinical EKG data. B.J.

A80-31635 # **Measurement of local indices of operator performance in the tracking mode (Izmerenie lokal'nykh pokazatelei kachestva deiatel'nosti operatora v rezhime slezheniia).** V. A. Chernomorets (Akademiia Nauk Ukrainskoi SSR, Institut Kibernetiki, Kiev, Ukrainian SSR). *Kibernetika i Vychislitel'naia Tekhnika,* no. 45, 1979, p. 65-70. In Russian.

The paper examines methods for describing operator behavior on the basis of empirical data concerning operator performance, with particular reference given to compensatory tracking operations. A method to increase the resolution of performance measurement methods is described, and attention is given to problems associated with the digitization of analog data. B.J.

A80-31636 # **Recognition of EKG structural elements in an automated complex (Raspoznovanie strukturnykh elementov elektrokardiogrammy v avtomatizirovannom komplekse).** E. M. Maslova and T. A. Volkhonskaia (Akademiia Nauk Ukrainskoi SSR, Institut Kibernetiki, Kiev, Ukrainian SSR). *Kibernetika i Vychislitel'naia Tekhnika,* no. 45, 1979, p. 76-80. 9 refs. In Russian.

A80-31637 # **Analog-digital converter for the ELKAR electrocardiograph (Analogo-tsifrovoi preobrazovatel' k elekrokardiografu ELKAR).** A. G. Pekhterev, F. K. Dzhugan, I. M. Vaisman, and G. N. Rabosh (Ministerstvo Zdravookhraneniia Ukrainskoi SSR, Vinnitskii Meditsinskii Institut, Vinnitsa, Ukrainian SSR). *Kibernetika i Vychislitel'naia Tekhnika,* no. 45, 1979, p. 88-90. In Russian.

A80-31638 # **Design principles for a system of automated processing of cardiological data on the M-6000 computer (Nekotorye printsipy postroeniia kompleksa avtomatizirovannoi obrabotki kardiologicheskoi informatsii spomoshch'iu EVM M-6000).** T. A. Volkhonskaia, E. M. Maslova, A. K. Galitskii, and M. A. Chekailo (Akademiia Nauk Ukrainskoi SSR, Institut Kibernetiki, Kiev, Ukrainian SSR). *Kibernetika i Vychislitel'naia Tekhnika,* no. 45, 1979, p. 91-94. In Russian.

A80-31639 # **Design characteristics of an imitation system for the study of physiological processes on a digital computer (Osobennosti postroeniia imitatsionnoi sistemy dlia issledovaniia na ETsVM fiziologicheskikh protsessov).** Iu. N. Onopchuk (Akademiia Nauk Ukrainskoi SSR, Institut Kibernetiki, Kiev, Ukrainian SSR). *Kibernetika i Vychislitel'naia Tekhnika,* no. 45, 1979, p. 103-106. 7 refs. In Russian.

The use of pseudo-observations to develop imitation software for the digital-computer investigation of physiological processes is examined; this limitation procedure can be used to study the dynamics of gas transfer in the human body and in sea-animal organisms. The development of imitation software is considered with reference to the determination of input data and the selection of numerical procedures and integration step. B.J.

A80-31800 * **Influence of auditory fatigue on masked speech intelligibility.** D. E. Parker, W. L. Martens, and P. A. Johnston (Miami University, Oxford, Ohio). *Acoustical Society of America, Journal,* vol. 67, Apr. 1980, p. 1392, 1393. Research supported by Miami University; Contracts No. F33615-75-C-5029; No. NAS9-14258.

Intelligibility of PB word lists embedded in simultaneous masking noise was evaluated before and after fatiguing-noise exposure, which was determined by observing the number of words correctly repeated during a shadowing task. Both the speech signal and the masking noise were filtered to a 2825-3185-Hz band. Masking-noise leves were varied from 0- to 90-dB SL. Fatigue was produced by a 1500-3000-Hz octave band of noise at 115 dB (re 20 micron-Pa) presented continuously for 5 min. The results of three experiments indicated that speed intelligibility was reduced when the speech was presented against a background of silence but that the fatiguing-noise exposure had no effect on intelligibility when the speech was made more intense and embedded in masking noise of 40-90-dB SL. These observations are interpreted by considering the recruitment produced by fatigue and masking noise. (Author)

A80-32216 # **Express-diagnostic criteria of the cardiohemodynamic efficiency of juvenile athletes (Ekspress-diagnosticheskie kriterii kardio-gemodinamicheskoi proizvoditel'nosti u iunykh sportsmenov).** V. S. Shaginian and V. P. Kovtun (Detskii Vrachebno-Fizkul'turnyi Dispanser, USSR). *Akademiia Nauk Gruzinskoi SSR, Soobshcheniia,* vol. 96, Oct. 1979, p. 185-188. In Russian.

A80-32230 # **Influence of longitudinal accelerations on fluid-electrolyte metabolism and renal function under conditions of immersion (Vliianie prodol'nykh peregruzok na vodno-solevoi obmen i funktsiiu pochek v usloviiakh immersii).** E. B. Shul'zhenko, A. I. Grigor'ev, V. B. Noskov, B. R. Dorokhova, and E. A. Aleksandrova. *Fiziologiia Cheloveka,* vol. 6, Mar.-Apr. 1980, p. 280-285. 16 refs. In Russian.

Three-day immersion experiments are carried out on ten healthy male individuals (25-30 yr) subjected to low-magnitude +Gz accelerations. It is found that a stay in immersion produces in a normal man an increase in diuresis and excretion of osmotically active substances including sodium. This process is most pronounced in the first day of immersion. Administration of isotonic NaCl solution causes accelerated elimination of fluid, sodium, osmotically active substances, and potassium; this should be considered a homeostatic reaction intended to recover the adequately decreased volume of intravascular fluid. Head-foot accelerations of low magnitude prevent the increase of diuresis and the excretion of electrolytes on the second and third days of the immersion period. S.D.

A80-32231 # **The circadian rhythm of aerobic efficiency (Sutochnyi ritm aerobnoi proizvoditel'mosti).** S. G. Krivoshchekov, V. F. Osipov, and Iu. A. Vlasov (Akademiia Meditsinskikh Nauk SSSR, Novosibirsk, USSR). *Fiziologiia Cheloveka,* vol. 6, Mar.-Apr. 1980, p. 310-316. 14 refs. In Russian.

Experiments were conducted on young healthy male subjects who performed various types of physical exercise. The objective was to evaluate the circadian rhythms of aerobic efficiency in man, along with the characteristics of physiological support of working capacity at different times of the day. Maximum oxygen uptake and 'pulse oxygen threshold' (POT) are considered. Possible causes for the circadian fluctuations of the POT are examined. It appears that during the circadian organization of the whole organism, the circadian rhythm of the cardiorespiratory-system functions assures during daytime an optimal readiness to active work; during nighttime the functional systems procure the conditions for the best course of reconstructive anabolic processes. S.D.

A80-32232 # **Effect of gas-mixture density on the performance of the respiratory system (Vliianie plotnostei gazovykh smesei na rabotu dykhatel'nogo apparata).** I. S. Breslav and E. L. Kalacheva

(Akademiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR). *Fiziologiia Cheloveka,* vol. 6, Mar.-Apr. 1980, p. 317-322. 20 refs. In Russian.

Experiments on healthy individuals reveal that during free breathing of gas mixtures of varying density (He-O2, SF6-02), man chooses such a regime of pulmonary ventilation which ensures the optimization of the relation between elastic and inelastic resistance to respiration without a significant change in the total performance of the respiratory system. During forced breathing, the gas-mixture density affects the energy cost of ventilation. When breathing a gas mixture of higher density than that of air, the functional reserves of the resiratory system are limited. S.D.

A80-32233 # **Functional state of the cardiovascular system following a three-day immersion and prophylactic rotations in a small-radius centrifuge (Funktsional'noe sostoianie serdechno-sosudistoi sistemy posle 3-sutochnoi immersii i profilakticheskikh vrashchenii na tsentrifuge korotkogo radiusa).** I. F. Vil'-Vil'iams and E. B. Shul'zhenko. *Fiziologiia Cheloveka,* vol. 6, Mar.-Apr. 1980, p. 323-327. 9 refs. In Russian.

An experimental study was carried out on volunteer healthy male individuals to evaluate the reaction of the circulatory system after mimicking the effect of detraining by water immersion and combining immersion with prophylactic gravitational accelerations in a small-radius centrifuge. The results obtained demonstrated the possibility of using periodic gravitational accelerations in a small-radius centrifuge over the range 0.8-1.6 Gz (at the 'foot' level) for reducing the effects of determining of the cardiovascular system, which were developed during immersion, and for maintaining the reserve capabilities of the circulatory system. S.D.

A80-32234 # **Sleep pattern variation during adaptation to high-altitude hypoxia (Izmenenie sna v protsesse adaptatsii k vysotnoi gipoksii).** V. B. Malkin, V. P. Danilin, and N. F. Landukhova. *Fiziologiia Cheloveka,* vol. 6, Mar.-Apr. 1980, p. 341-347. 18 refs. In Russian.

During three successive nights nine male subjects were placed in an altitude test chamber (4200 m) right before the initial stage of sleep. Regular changes in the nighttime sleep phase structure were observed. These changes were reduced total sleep duration and reduced number of completed sleep cycles. The observations indicated extended Stage I duration, slow-sleep shortening, and distinct deprivation of fast sleep. Sleep normalization was observed during the second and particularly the third night. S.D.

A80-32235 # **Investigation of the predictive value of electronystagmograms /ENGs/ in professional-selection vestibulometry (Issledovanie prognosticheskoi tsennosti elektronistagmogramm /ENG/ pri vestibuliarnom profotbore).** B. I. Poliakov, M. I. Serebrennikov, Iu. V. Lysenko, Iu. P. Ozerov, and B. V. Permiakov. *Fiziologiia Cheloveka,* vol. 6, Mar.-Apr. 1980, p. 366-368. 9 refs. In Russian.

A rotating-chair test procedure is proposed whereby healthy male individuals experienced nystagmus under specified rotary accelerations in a rotary chair. It is found that the intensity of nystagmus is higher for persons with low vestibular-autonomic stability level (VSL) than for persons with high VSL. The dynamics of horizontal-nystagmus disappearance is a distinct indicator for detecting persons with low and high VSL. Conditions for recognizing persons prone to VSL are determined. S.D.

A80-32305 A theoretical basis for microwave and RF field effects on excitable cellular membranes. C. A. Cain (Illinois, University, Urbana, Ill.). *IEEE Transactions on Microwave Theory and Techniques,* vol. MTT-28, Feb. 1980, p. 142-147. 25 refs.

A model of a mechanism for nonthermal interaction of RF or microwave fields with excitable cellular membranes is presented. It may be possible for an oscillating component of membrane potential to change the conductance of the membrane to all ion species which transverse voltage-dependent membrane channels. Some specific effects on squid giant axon predicted by the model are discussed. (Author)

A80-32413 Suprathreshold processing of complex visual stimuli - Evidence for linearity in contrast perception. A. P. Ginsburg, M. W. Cannon (USAF, Aviation Vision Laboratory, Wright-Patterson AFB, Ohio), and M. A. Nelson (Systems Research Laboratories, Inc., Dayton, Ohio). *Science,* vol. 208, May 9, 1980, p. 619-621. 18 refs.

Magnitude estimation experiments show that perceived contrast for both sine and square waves is a linear function of stimulus contrast. The suprathreshold sine:square ratio required for equal perceived contrast derived from these data was verified by contrast matching experiments. These findings imply a high degree of linearity in suprathreshold visual processing of contrast. (Author)

A80-32414 Saccadic eye movements and body sway. K. D. White (Florida, University, Gainesville, Fla.), R. B. Post, and H. W. Leibowitz (Pennsylvania State University, University Park, Pa.). *Science,* vol. 208, May 9, 1980, p. 621-623. 18 refs. Research supported by the Alexander von Humboldt-Stiftung; Deutsche Forschungsgemeinschaft Contract No. SFB-70; Grant No. PHS-MH-08061.

Different conditions of moving retinal images show differential influences on postural stability. A surrounding pattern moved during steady fixation increases body sway, but similar image motions generated by voluntary saccades do not. Mechanisms for postural control do not respond to visual feedback during saccades. Analogous principles in saccadic suppression and space constancy are discussed. (Author)

A80-32576 Air safety in 1978 from the medical point of view (Point de vue médical sur la sécurité aérienne en 1978). J. Timbal (Laboratoire Central de Biologie Aéronautique, Paris, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 1st Quarter, 1979, p. 12-14. In French.

Medical aspects of the prevention of aircraft accidents are discussed. A brief review of aircraft accident rates in the past 20 years is presented which points out that this rate has been decreasing exponentially towards an asymptotic level, with the proportion of human responsibility remaining fairly constant. The selection, medical and psychological surveillance and training of flight personnel, aircraft accident investigation, emergency equipment improvements and the design of future aircraft are discussed as means of improving air safety. It is concluded that the most important of these means will be the medical training of flight personnel and the intensification of accident investigations, while close attention must also be given to the design of future aircraft equipment. A.L.W.

A80-32577 The investigator confronted with medical problems in technical investigations of aircraft accidents (L'enquêteur confronté aux problèmes médicaux lors des investigations techniques sur les accidents d'avions). M. Vigier. *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 1st Quarter, 1979, p. 15-19. In French.

The close cooperation necessary between technical and medical investigators of aircraft accidents is discussed from the point of view of the technical investigator. The general framework within which aircraft accident investigations are conducted is reviewed, with attention given to the requirements of the International Civil Aviation Organization and the provisions of the French government. The responsibilities of the investigator with respect to the determination of events and conditions before, during and after the accident are outlined, and the role of medical personnel in the analysis of crew medical histories and the sequence of events leading to and during the accident and the examination of survivors and victims is emphasized. Finally, recommendations concerning the modification of international and national regulations and present autopsy procedures, medical instruction, equipment cases and accident report formats to reflect the necessary medical-technical cooperation are presented. A.L.W.

A80-32578 The importance of toxicological studies in aircraft accidents (Intérêt des études toxicologiques dans les accidents aériens). P. E. Picart and J. P. Delcroix (Centre de Recherches de Médecine Aéronautique, Paris, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 1st Quarter, 1979, p. 20-23. 11 refs. In French.

The application of toxicological techniques to the theoretical reconstruction of aircraft accidents is discussed. The possible roles of voluntary substances, including alcohol, medications and CO and nicotine from cigarette smoke, and environmental intoxicants including fuel, cooling fluids, lubricants, hydraulic fluids and battery fluids, in causing and allowing the identification of causes of aircraft accident fatalities are examined, and means for determining their levels in the body are indicated. The importance of toxicological investigations to aircraft accident investigation is concluded, and it is noted that such studies can only be considered as part of a cooperative effort between the toxicologist and the investigating body for the rapid acquisition of useful information. A.L.W.

A80-32579 The contribution of histopathology to investigations following aircraft accidents (Contribution de l'histopathologie aux enquêtes après accidents aériens). C. Nogues. *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 1st Quarter, 1979, p. 24-30. 8 refs. In French.

The histopathological examination of tissue samples obtained in the investigation of aircraft accidents is discussed. Information obtainable from studies of hepatic, pulmonary, renal and visceral lesions and tissue debris is illustrated, and the classification of lesions into those caused by the accident, those of apparently questionable significance (possible relating to pre-existing conditions), those contributing to the reconstruction of the events of the accident and those not relating to the cause of the accident is considered. It is concluded that, although histopathological analysis rarely leads to the proof of the cause of an aircraft accident, it can provide information as to the sequence of events occurring during the accident and pre-existing conditions leading to the aggravation of dangerous circumstances. A.L.W.

A80-32580 A physical study of vibratory stress - Physiological interpretation - Importance in aircraft accidents (Etude physique de l'agression vibratoire - Interprétation physiologique - Intérêt dans les accidents d'aéronefs). P. Quandieu, P. Borredon, and L. Pellieu (Centre d'Etudes et de Recherches de Médecine Aérospatiale, Paris, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 1st Quarter, 1979, p. 31-35. In French.

The physical responses of an animal to mechanical vibration are investigated, taking into account the effects of muscle tension and the implications of the study for aircraft accident investigations. The relative acceleration of a laboratory rabbit with its feet secured to a test platform with respect to the platform, which was undergoing 10-Hz sinusoidal vibrations at peak magnitudes of 1 g, was measured by a force sensor placed under the animal and attached to the platform. It is found that muscular activity can serve to damp the vibrations. Results are interpreted in terms of a model of a mechanical system consisting of a series of passive and active rejection mechanical filters connected in parallel, with stiffness dependent on muscle tension. A.L.W.

A80-32581 The organization of medical aid in air disasters - Berlin-Tegel international airport (Organisation de secours médicaux en cas de catastrophe aérienne - A propos de l'aéroport international de Berlin-Tegel). G. Poyot (Armée de l'Air, Base Aérienne, Ochey, Meurthe-et-Moselle, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 1st Quarter, 1979, p. 36-39. In French.

Consideration is given to the provisions for medical aid in the event of a major passenger aircraft crash at the Berlin-Tegel international airport. The emergency medical plan consists of the localization of the accident and the broadcasting of the medical and fire alert, the fighting of any fire and the freeing of victims, medical first aid (triage and the preparation of wounded for evacuation) and the evacuation of wounded to the receiving hospitals. Medical personnel are drawn from the permanent medical staff of the air base having jurisdiction over the airport and from local hospitals, and are equipped with a mobile triage and first aid station capable of handling 75 casualties. Medical strategies include a pretriage to identify and treat the most seriously wounded at the site of the accident, the optimal placement of the triage center, and the utilization of specialized equipment packages designed for the treatment of the most common aircraft accident injuries. The plan requires the supervision of the chief airport physician from the time of the first alert to the evacuation of the wounded, and close cooperation between the health services of the base. A.L.W.

A80-32582 Medical considerations in light aircraft accidents (Considérations médicales sur les accidents de l'aviation légère). G. Plantureux, R. Auffret, and J. Lavernhe (Aéroclub de France, Paris, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 1st Quarter, 1979, p. 40-44. 16 refs. In French.

The causes and medical consequences of accidents involving private airplanes and gliders are analyzed. Light aircraft accident and injury rates are reviewed, and it is noted that both rates have decreased in the past ten years, with involuntary landings and mid-air collisions the greatest sources of fatal accidents. A detailed examination of the causes of light aircraft accidents demonstrates the predominant contributions of human errors, the most prevalent of which are found to be errors in judgement and insufficient pilot ability. A statistical analysis of the bodily distribution and severity of the injuries of 334 persons injured in light aircraft accidents in France between 1974 and 1977, indicates that very serious injuries are rare and are usually associated with rapid death. Most injuries occur to the head, neck and upper limbs rather than the better protected thorax and abdomen. Means suggested to reduce light aircraft accidents and their severity include modifications to cabin equipment, and improved pilot training and regulation. A.L.W.

A80-32583 The place of the psychological factor among the causes of aircraft accidents in general aviation (La place du facteur psychique dans les causes des accidents aériens en aviation générale). R. J. Digo (Centre Principal d'Expertise Médicale du Personnel Navigant, Paris, France) and J. Lavernhe (Compagnie Nationale Air France, Centre d'Examen Médical du Personnel Navigant, Paris, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 1st Quarter, 1979, p. 45-51. In French.

The significance of psychological factors as causes of general aviation aircraft accidents is discussed. The qualitative deficiencies of the medical examination of general aviation pilots and the unique psychological character of general aviation are pointed out, and the causes of aircraft accidents are classified as extrinsic (meteorological, technical, or infrastructural) or intrinsic human factors, which are further subdivided into human technical failures, somatic failures, psychosomatic failures, psychological failures, moral failures, and human relations failures. The various psychopathological traits encountered in general aviation are then examined, including age-related disorders, neuroses, psychosomatic disorders, psychotic states, psychopathic personalities and bio-neuro-organic states including intoxication. Finally, a set of measures intended to reduce the incidence of psychologically caused aircraft accidents is proposed. A.L.W.

A80-32584 The influence of intermittent aircraft noise on sleep. II (Influence des bruits intermittents d'avions sur le sommeil. II). M. V. Strumza. *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 1st Quarter, 1979, p. 52-59. In French.

Results of investigations of the immediate reactions of sleeping persons to intermittent sound stimuli are presented as part of a review of studies of the influence of intermittent aircraft noise on the sleep of persons living near an airport. Responses to the noise are

shown to depend on the type of noise, its intensity and duration, the number of stimuli during the night, the information content of the noise and the ambient environment, and expressions relating peak sound intensity, sound duration, and stimulus number to waking frequencies, sleep stage disturbances as indicated by electro-encephalography and neuro-autonomic reactions are presented. The rates of physiological responses to noise are also shown to depend on the age, sleep stage, condition with respect to sleep deprivation, circadian rhythm and individual characteristics of the sleepers, although not on their sex. A.L.W.

A80-32585 Considerations with regard to a test of the Essilor visiotest (Réflexions à propos d'un essai du visiotest Essilor). J. P. Chevaleraud (Service de Santé des Armées, Paris, France), M. Maille (Hôpitaux des Armées, Paris, France), and G. Santucci. *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 1st Quarter, 1979, p. 60-62. In French.

Results of an evaluation of the visiotest device in the detection of vision anomalies are reported. Data obtained from the visiotest concerning the monocular visual acuities, myopic or hypermetropic tendencies, horizontal and vertical oculomotor equilibria, stereoscopic vision and color vision of 75 male subjects were compared with that obtained using conventional techniques. Discrepancies between the results of measurements of all factors with the exception of vertical oculomotor equilibrium are noted and modifications which would allow an improvement in visiotest performance are proposed. It is concluded that the visiotest may be used pending modifications for the monitoring of visual aptitudes and in the physical examination of private pilot's license candidates. A.L.W.

A80-32586 The application of echocardiography to the cardiological evaluation of flight personnel (Apport de l'échocardiographie à l'expertise cardiologique du personnel navigant). J. Droniou, J. C. Duret, J. C. Richart, and J. Pernod. *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 1st Quarter, 1979, p. 63-68. 11 refs. In French.

Following a brief review of the principles and techniques of the established method of one-dimensional motion time echocardiography, and the promising technique of two-dimensional echocardiography, the importance of echocardiography to the cardiological evaluation of flight personnel is discussed. The use of echocardiography in the diagnosis of two conditions incompatible with aeronautical activity, mitral prolapsus and obstructive cardiomyopathy is illustrated, and consideration is given to its use in the evaluation of myocardial function. It is concluded that the noninvasive character and information quality of echocardiography are well adapted to the cardiological evaluation of flight personnel, and make the technique well suited to the selection and monitoring of astronauts and pilots of high-performance aircraft. A.L.W.

A80-32587 Abdominal echotomography - Its place in the evaluation of flight personnel (Echotomographie abdominale - Sa place dans l'expertise du personnel navigant.) E. Robin, J. Taboury, J. Flageat, C. Kleitz, P. J. Metges, and R. P. Delahayé (Hôpital d'Instruction des Armées Begin, Saint Mandé, Val-de-Marne; Service de Santé pour l'Armée de l'Air, Ecole d'Application, Paris, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 1st Quarter, 1979, p. 69-74. In French.

The application of echotomography to the physical evaluation of flight personnel is discussed. The physical bases of the propagation of ultrasonic waves through a medium and at an interface between two media and the generation and detection of ultrasonic waves are reviewed, and the operational principles of amplitude-mode, time-motion-mode, brightness-mode and dynamic-mode echotomography are outlined. Information obtainable from an echotomographic examination of the liver, the spleen, the gall bladder, the pancreas, the kidneys, the abdominal aorta and the bladder is discussed, and the principle cases in which echotomography is employed to detect and characterize specific abdominal conditions are surveyed. It is concluded that echography represents a rapid, inexpensive, non-invasive means of obtaining photographic records without possible side effects, and has a great potential for use in aeronautical medicine. A.L.W.

A80-32588 Central field of vision and electroculography in moderate hypoxia (Champ visuel central et électroculographie en hypoxie modérée). G. F. Santucci, B. Darnaud, and J. Chevaleraud. *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 3rd Quarter, 1979, p. 192-195. 8 refs. In French.

Experiments were conducted at an altitude of 3600 m on 10 healthy subjects (9M plus 1F) 20 to 30 years of age. Each subject was required to recognize the different light flashes presented to him and to define their location in a 30-deg visual field. The results indicate that a 3600-m (moderate) hypoxia is incapable of perturbing both the central field of vision and the electroculogram. In particular, when a visual field is affected at such an altitude, this disorder is essentially related more to the central components than to the retinal components. S.D.

A80-32589 On the feasibility of contact lenses for flight personnel (A propos de la tolérance des protheses de contact chez le personnel navigant). J. P. Boissin (Compagnie Nationale Air France, Service Médical, Paris, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 3rd Quarter, 1979, p. 198-200. In French.

Regular annual supervision and answers given by contact-lens wearers to an anonymous questionnaire have demonstrated that contact lenses do not present a severe hazard to aircrew members. However, the conditions under which the contact lenses are employed often lead to the impracticality of contact lenses and thus to a relatively important rate at which crew members gave up wearing contact lenses. S.D.

A80-32590 Study of pilot's sight direction on Mercure flight simulator (Etude de la direction du regard des pilotes sur simulateur de vol Mercure). J. P. Papin, D. Viard (Centre de Recherches de Médecine Aéronautique, Paris, France), and M. Neboit (Organisme National de Sécurité Routière, Montlhéry, Essonne, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 3rd Quarter, 1979, p. 201-204. In French.

The direction of sight of a pilot is analyzed in the Mercure flight simulator in the contex of research work on the nature of visual information to be presented to pilots on future electronic visual-display systems. The observations are recorded during the takeoff and landing phases using the NAC Eye Recorder on 16-mm film. Results are given for landing with a headup display. Finally, a preliminary interpretation is presented on the basis of a few analyzable results. S.D.

A80-32591 Considerations regarding sudden deafness - Aeronautical incidents (Réflexions sur la surdité brusque - Incidences aéronautiques). H. Lienhart, P. Salgas (Hôpitaux des Armées, Paris, France), and P. Blanc (Centre Principal d'Expertise Médicale du Personnel Navigant, Paris, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 3rd Quarter, 1979, p. 205-210. 9 refs. In French.

In the light of pertinent observations, the paper reviews the principal data on the diagnostic and urgent treatment of sudden deafness in aeronautical incidents. Attention is given to the possibility of recovery, even complete, in cases detected after long delays. The consequences of sudden deafness at the level of medical examination of air flight personnel are identified. S.D.

A80-32592 Impedance measurement - Importance in otologic assessment of air flight personnel (L'impédancemétrie - Intéret dans l'expertise otologique du personnel navigant de l'aéronautique). H. Lienhart (Hôpitaux des Armées, Paris, France) and P. Blanc (Centre Principal d'Expertise Médicale du Personnel Navigant, Paris, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 3rd Quarter, 1979, p. 211-216. In French.

Following a brief outline of the principle and method of measuring the impedance of the middle ear, the paper reviews the results that can be attained particularly in the diagnosis of closed-tympan transmission deafness and in the study of auditory-tube permeability. Clinical observations are presented which demonstrate the important role of the impedance-measuring method in the medical assessment of air flight personnel. S.D.

A80-32593 Investigation of the cardiac inotropic effect occurring at the onset of hypoxic hypoxia (Etude de l'effet inotrope cardiaque rencontré au début de l'hypoxie hypoxique). P. J.-P. Borredon, M. Fischler, C. Grousset, J.-D. Massard, P. Quandieu, M. Marin, and F. Lienhard (Service de Santé pour l'Armée de l'Air, Ecole d'Application; Centre de Recherches de Médecine Aeronautique, Paris, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 3rd Quarter, 1979, p. 217-224. 11 refs. In French.

The increase in the left ventricular pressure (LVP) during the initial phase of hypoxic hypoxia produced by artificial ventilation with pure nitrogen is investigated in the rabbit. ATP and creatine phosphate (CP) contents in the myocardium are determined. During the initial phase of hypoxic hypoxia, the LVP increases with decreasing CP content, while the ATP level remains unchanged. A linear relation between LVP increase and CP evolution is observed with epinephrine injection. The CP tissue level measurement appears to be an excellent criterion for determining the dynamic effort performed or to be performed by the heart cell effector. S.D.

A80-32594 Effect of normobaric hyperoxia on renal ammoniogenesis (L'effet de l'hyperoxie normobare sur l'ammoniogenese rénale). I. Nastoiu, I. Pintilie, and T. Bades (Centre Médicine Aéronautique, Bucarest, Rumania). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 3rd Quarter, 1979, p. 225-227. 10 refs. In French.

The present study on pilot trainees deals with an analysis of the influence of short-duration normobaric hyperoxia on renal ammonium generation as a mechanism of acid-base homeostasis. The analysis is intended to elucidate the extent to which normobaric (100 percent) oxygen respiration participates in disturbing the acid-base balance of the organism. It is shown that a decrease in the hydrogen ions at the renal tubular cell level, as a result of respiratory alkalosis induced by normobaric hyperoxia, does not bring about renal ammoniogenesis. S.D.

A80-32595 Preliminary results of microwave effects on the central nervous system of a primate /Macaca mulatta/ (Résultats préliminaires de l'étude des effets des micro ondes sur le systeme nerveux central d'un primate /Macaca-mulatta/). M. J. Klein and C. L. Milhaud (Centre de Recherche de Médecine Aérospatiale, Paris, France). *(Société Française de Radioprotection, Congrès International, 9th, Nainville-les-Roches, France, May 22-26, 1978.) Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 3rd Quarter, 1979, p. 232-237. 47 refs. In French. Direction des Recherches, Etudes et Techniques Contracts No. 74-1147; No. 77-1001.

Thirteen adult, male Macaque rhesus monkeys (4-8 kg) were exposed to ionizing radiation under different experimental conditions: 9 monkeys for electrophysiological cerebral studies, and 4 monkeys for the study of behavioral effects. Attention is given to cerebral electrogenesis in the monkey. Preliminary results indicate that the thermal-origin effects on cerebral electrogenesis and behavior appear to be well established above a certain average power density. Adaptation of the animal model to the wavelength under study will make it possible to reduce the discrepancies of present biological results. S.D.

A80-32596 Vibration transmission through different helicopter seat cushions (Transmissibilité des vibrations à travers différents coussins de siège d'hélicoptère). J. L. Poirier (Centre d'Essais en Vol, Laboratoire de Médecine Aérospatiale, Brétigny-sur-Orge, Essonne, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 4th Quarter, 1979, p. 262-268. In French.

Vibration tests were conducted in order to determine optimal cushion-backrest combinations for helicopter seats. Subjects were subjected to four types of acceleration at sinusoidal vibration frequencies of 2 and 30 Hz. A summary of results is provided, and the optimal (in terms of comfort) cushion is identified. B.J.

A80-32599 Gastric ulcers affecting pilots of the Peruvian air force (L'ulcère gastrique chez le personnel de pilotes de la force de l'air du Pérou). A. Cueto Duthurburu. *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 4th Quarter, 1979, p. 284-287. 12 refs. In French.

A80-32600 Acute microwave irradiation with regard to a case recently monitored at Begin Hospital (Irradiation aiguë aux micro-ondes à propos d'un cas récemment suivi à l'Hôpital Begin). R. P. Delahaye, P. Doury, J. Conrad, P. J. Metges, and S. Pattin (Hôpital d'Instruction des Armées Begin, Saint Mandé, Val-de-Marne; Service de Santé pour l'Armée de l'Air, Ecole d'Application; Service de Santé pour l'Armée de Terre, Ecole d'Application, Paris, France). *Médecine Aéronautique et Spatiale, Médecine Subaquatique et Hyperbare,* vol. 18, 4th Quarter, 1979, p. 293-296. In French.

The case history of a radar technician exposed to 20 min of global microwave irradiation is reported. The subject experienced a sensation of heat in his hands and lower back pain during the accidental exposure during routine antenna maintenance, which intensified following the exposure, resulting in inability to move and nausea for a period of four days. A comprehensive examination on the fourth day, however, revealed no clinical, hemotological, biochemical or opthalmological irregularities. Recommendations concerning the prevention of further accidental exposure to microwaves by workers are presented. A.L.W.

STAR ENTRIES

N80-21014*# National Aeronautics and Space Administration, Washington, D. C.
ON THE CELLULAR AUTOIMMUNE MECHANISM FOR ELIMINATING ERYTHROCYTES NORMALLY AND UNDER EXTREME INFLUENCES
Ya. I Pukhova, I. A. Terskov, A. Ya. Anikina, and A. V. Shashkin Mar. 1980 15 p refs Transl. into ENGLISH from Patol. Fiziol. Eksp. Ter. (USSR), no. 2, Mar. - Apr. 1979 p 16-22 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3199)
(NASA-TM-75735) Avail: NTIS HC A02/MF A01 CSCL 06C

The presence of an autoimmune cellular mechanism for destroying erythrocytes on the basis of results of experiments in vivo is demonstrated in the blood and the organs. This mechanism is made up of a population of immunocompetent killer-lymphocytes which originates in the bone marrow and the thymus, and which is manifested in the local hemolysis effect. J.M.S.

N80-21015*# National Aeronautics and Space Administration, Washington, D. C.
ADRENOCORTICAL RESPONSE IN RATS SUBJECTED TO A STRESS OF RESTRAINT BY IMMOBILIZATION WHETHER ACCOMPANIED BY HYPOTHERMIA OR NOT
Laia Buchel, Monique Prioux-Guyonneau, and Lola Libian Apr. 1980 10 p refs Transl. into ENGLISH from Compt. Rend. Soc. Biol. (France), v. 168, no. 10-12, 1974 p 1202-1207 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-76119) Avail: NTIS HC A02/MF A01 CSCL 06C

The restraint associated with hypothermia which increases the adrenal activity in rats was investigated. In rats with nomothermia or light hypothermia, the plasma and adrenal corticosterone levels increase at least threefold whatever the duration of restraint. Their return to normal values depends on the duration of the restraint. Exposure to cold produces in free rats a light hypothermia with an increase of the plasma and adrenal corticosterone levels, and in restraint animals an important hypothermia which does not potentiate the stimulation of adrenocortical activity induced by the restraint alone. R.C.T.

N80-21016*# National Aeronautics and Space Administration, Washington, D. C.
REDUCTION OF THE DURATION OF RESTRAINT FOR THE PRODUCTION OF EXPERIMENTAL ULCERS IN RATS: APPLICATION TO THE STUDY OF PROTECTIVE SUBSTANCES
L. Buchel and D. Gallaire Apr. 1980 7 p refs Transl. into ENGLISH from Compt. Rend. Soc. Biol. (France), v. 157, no. 6, 1963, p 1225-1228 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-76136) Avail: NTIS HC A02/MF A01 CSCL 06C

An experiment is described which was designed to cause ulcers in rats, but requiring less restraint time than previously used procedures. The method and results are presented. F.O.S.

N80-21017*# National Aeronautics and Space Administration, Washington, D. C.
FIFTH WORKING CONFERENCE (SPACE BIOLOGY) AT THE 21ST PLENARY SESSION OF COSPAR
S. S. Yurov Mar. 1980 4 p Transl. into ENGLISH from Radiobiologiya (USSR), v. 18, no. 4, May 1979 p 786 Conf. held at Innsbruck, 28 May - 10 Jun. 1978 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3199)
(NASA-TM-76107) Avail: NTIS HC A02/MF A01 CSCL 06C

Space radiobiology is discussed with emphasis on the biological effects of heavy charged particles. Findings of spaceborne experiments on fungi, eggs, and seeds are presented. K.L.

N80-21018 Pennsylvania State Univ., University Park.
PLASMA CORTISOL LEVELS AND AUDITORY FUNCTIONING IN HUMANS EXPOSED TO SHORT AND PROLONGED DURATIONS OF NOISE Ph.D. Thesis
Thomas Edward Bennett 1979 154 p
Avail: Univ. Microfilms Order No. 8005976

Audiometric and hormonal effects of noise exposure were studied in male and female subjects exposed to moderately intense noise (85 dBA, broadband, pink noise) for short and prolonged durations. The major focus was on: (1) characterizing changes in circulating cortisol levels (using radioimmunoassay) before, during, and after noise exposure; (2) measuring the effects of noise on three facets of auditory perception (pure tone threshold sensitivity, level of initial masing perception, and loudness discrimination ability); and (3) examining possible relationships among duration of noise exposure, curculating hormone levels, and hearing ability in male and female human subjects. It was established that noise exposure results in a decreased ability to detect pure tones (threshold shifts), an increased ability to detect changes in loudness (a recruitment phenomenon), and a decreased ability to detect, tones in the presence of background noise (discrimination impairments). Dissert. Abstr.

N80-21019*# National Aeronautics and Space Administration, Washington, D. C.
INITIAL DYNAMICS OF THE EKG DURING AN ELECTRICAL DEFIBRILLATION OF THE HEART
I. I. Bikov, Ya. P. Chebotarov, and V. G. Nikolaev Apr. 1980 12 p refs Transl. into ENGLISH from Fiziol. Zh. Akad. Nauk Ukr RSR (USSR), v. 15, no. 3, 1969 p 322-327 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(NASA-TM-76002) Avail: NTIS HC A02/MF A01 CSCL 06P

In tests on 11 mature dogs, immobilized by means of an automatic blocking and synchronization system, artefact free EKG were obtained, beginning 0.04-0.06 sec after passage of a defibrillating current. Different versions of the start of fibrillation were noted, in application of the defibrillating stimulus in the early phase of the cardiac cycle. A swinging phenomenon, increasing amplitude, of fibrillation was noted for 0.4-1.5 sec after delivery of a subthreshold stimulus. Conditions for a positive outcome of repeated defibrillation were found, and a relationship was noted between the configuration of the exciting process with respect to the lines of force of the defibrillating current and the defibrillation threshold. It was shown that the initial EKG dynamics after defibrillation is based on a gradual shift of the pacemaker from the myocardium of the ventricles to the sinus node, through phases of atrioventricular and atrial automatism. Author

N80-21020*# National Aeronautics and Space Administration, Washington, D. C.
ATHEROSCLEROTIC CHANGES OF VESSELS CAUSED BY RESTRICTION OF MOVEMENT
G. S. Gvishiani, N. G. Kobakhidze, M. G. Mchedlishvili, and T. I. Dekanosidze Mar. 1980 7 p refs Transl. into ENGLISH from Soobshch. Akad. Nauk Gruz. SSR (USSR), v. 59, no. 3, 1970 p 701-704 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(NASA-TM-76022) Avail: NTIS HC A02/MF A01 CSCL 06S

The effect of restriction of movement on the development of atherosclerosis was studied in rabbits. Drastic restriction of movement for 20 and 30 days causes atherosclerotic alterations of the aorta and shifts in ECG which are characteristic of coronary atherosclerosis. At the same time, shortening of the duration of blood coagulation and an increase in the content of catecholamines and beta-lipoproteids occur. R.C.T.

N80-21021*# National Aeronautics and Space Administration, Washington, D. C.
COLD SHIVERING ACTIVITY AFTER UNILATERAL DESTRUCTION OF THE VESTIBULAR APPARATUS
G. I. Kuzmina Mar. 1980 11 p refs Transl. into ENGLISH from Fiziol. Zh. SSSR (USSR), v. 65, no. 11, 1979 p 1655-1660 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(NASA-TM-76099) Avail: NTIS HC A02/MF A01 CSCL 06P

The bioelectric activity of muscles (flexors and extensors of the forelimbs and hindlimbs) during cold shivering after unilateral destruction of the vestibular apparatus. It was found, that unilateral delabyrinthing produces bilateral facilitation of cold shivering in the flexor extremities more pronounced on the ipsilateral side. In the extensor muscles there was an absence of bioelectric activity both before and after delabyrinthing. Enhancement of cold shivering in the flexor extremities following intervention was evidently conditioned by removal of the inhibiting effect of the vestibulary apparatus on the function of special centers. R.C.T.

N80-21022*# National Aeronautics and Space Administration, Washington, D. C.
GLYCEROL TEST IN DIAGNOSING INCREASED INTRALABYRINTH PRESSURE
B. Ya. Limar, N. S. Mischanchuk, M. V. Kulikova, and V. I. Yermilova Mar. 1980 10 p refs Transl. into ENGLISH from Zh. Ushnykh Nosovykh Gorlovykh Bolez. (USSR), no. 6, Nov. - Dec. 1979 p 55-59 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-76110) Avail: NTIS HC A02/MF A01 CSCL 06E

The problem of increased intralabyrinth pressure as one of the causes of cochlear-vestibular disorders is discussed. A technique for conducting the glycerol test is presented. R.C.T.

N80-21023*# National Aeronautics and Space Administration, Washington, D. C.
COAGULATING ACTIVITY OF THE BLOOD, VASCULAR WALL, AND MYOCARDIUM UNDER HYPODYNAMIA CONDITIONS
B. V. Petrovskiy, ed., E. I. Chazov, ed., and S. V. Andreyev, ed. Mar. 1980 10 p Transl. into ENGLISH from the book "Aktual Nyye Problemy Gemostaziologii, Molekulyarno-Biologicheskye i Fiziologicheskiye Aspekty" Moscow, Nauka Press, 1979 p 45-52 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3199)
(NASA-TM-76056) Avail: NTIS HC A02/MF A01 CSCL 06S

In order to study the effects of hypodynamia on the coagulating properties of the blood, vascular wall, and myocardium, chinchilla rabbits were kept for varying periods in special cages which restricted their movements. At the end of the experiment, blood samples were taken and the animals were sacrificed. Preparations were made from the myocardium venae cavae, and layers of the aorta. Two resultant interrelated and mutually conditioned syndromes were discovered: thrombohemorrhagic in the blood and hemorrago-thrombotic in the tissues. R.C.T.

N80-21024*# National Aeronautics and Space Administration, Washington, D. C.
PROPHYLAXIS AND TREATMENT OF SEASICKNESS
M. Yefremenko Mar. 1980 7 p ref Transl. into ENGLISH of Morsk. Sb. (USSR), no. 6, Jun. 1979 p 40-42 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3199)
(NASA-TM-76108) Avail: NTIS HC A02/MF A01 CSCL 06E

Depending upon the dominant type of symptoms, seasickness is divided into three forms: nervous, gastro-intestinal, and cardiovascular. Various medications are recommended appropriate to these forms. The first goal is normalization of impaired system functions as well as metabolism and the electrolyte and acid-base condition of the organism. Dietary recommendations are made and specific suggestions on the use of physical exercise, including prophylatic vestibular training exercises. Author

N80-21025*# National Aeronautics and Space Administration, Washington, D. C.
EFFECT OF SPACE FLIGHT ON SODIUM, COPPER, MANGANESE AND MAGNESIUM CONTENT IN THE SKELETAL BONES
A. A. Prokhonchukov, V. P. Taitsev, B. A. Shakhunov, V. A. Zhizhina, A. G. Kolesnik, and N. A. Komissarova Oct. 1979 11 p refs Transl. into ENGLISH from Patol. Fiziol. Eksp. Ter. (USSR), no. 6, Nov. - Dec. 1978 p 65-70 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3199)
(NASA-TM-75506) Avail: NTIS HC A02/MF A01 CSCL 06P

Sodium content decreased in the human skeletal bones and rose in the rat bones following space flight. In man copper content rose in the femoral bone and decreased in the vertebral body and the sternum, but was unchanged in the rest of the bones. Magnesium content was decreased in the femoral bone and the sternum, and in the vertebrae, but remained unchanged in the rest of the bones. Possible mechanisms of the changes detected are discussed. Author

N80-21026*# National Aeronautics and Space Administration, Washington, D. C.
EFFECTS OF HYPOKINESIA AND HYPODYNAMIA ON THE INTRAORGANIC ARTERIES OF THE HEART
L. A. Aleksina Mar. 1980 7 p refs Transl. into ENGLISH from Arkh. Anat., gistol. embriol. (USSR), v. 61, no.11, 1971 p 92-95 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3199)
(NASA-TM-76069) Avail: NTIS HC A02/MF A01 CSCL 06S

The experiments were performed on rabbits kept in small cages for 2-12 weeks. Their motor activity was greatly restricted. The arteries of the heart were injected with an India ink-gelatine mass; injection was directly into the coronary arteries. After fixation in 10% formaline solution 120 micron sections were cut. These were cleared by the Malygin method and examined with a light microscope. After exposure to hypokinetic conditions the picture of the cardiac arterial bed changed. During the first weeks the capillaries of the myocardium were significantly constricted, their course becoming sinuous. With prolonged exposure to hypokinetic conditions the vessels were found to dilate gradually and myocardial architectonics changed. Author

N80-21027# Illinois Univ. at the Medical Center, Chicago. Dept. of Occupational and Environmental Medicine.
MODEL FOR MEASURING THE HEALTH IMPACT FROM CHANGING LEVELS OF AMBIENT AIR POLLUTION: MORBIDITY STUDY
Tsukasa Namekata, Bertram W. Carnow, Zanet Flournoy-Gill, Eileen B. OFarrell, and Domenic Reda Aug. 1979 74 p refs (Contract EPA-68-02-2492)
(PB80-107030; EPA-600/1-79-024) Avail: NTIS HC A04/MF A01 CSCL 06T

The relationship between human health and ambient air concentrations of the major pollutants in the city of Chicago is examined using linear regression models to quantitatively estimate the degree of the air pollution contribution to emergency room visits for cardiac and respiratory diseases. According to the results, sulfur dioxide based on patient exposure levels accounts for about 13% of the variation of emergency room visits for acute bronchial and lower respiratory infections and about 22% for total cardiac diagnoses. Nitric oxide based on measurements from the closest site to the hospitals can account for about 7% of the variation of visits for total respiratory diagnoses, 6% for allergic conditions

and upper respiratory infections, 4% for total cardiac diagnoses and 4% for hypertension and vascular heart diseases. GRA

N80-21028# Oregon State Univ., Corvallis. Dept. of Electrical and Computer Engineering.
ABSORPTION CHARACTERISTICS OF PROLATE SPHEROIDAL MODEL OF MAN AND ANIMALS AT AND NEAR RESONANCE FREQUENCY Final Report, 15 Sep. 1976 - 15 Mar. 1978
Vijai K. Tripatai and Hyuckjae Lee Aug. 1979 74 p refs
(Grant EPA-R-804697)
(PB80-108293; EPA-600/1-79-025) Avail: NTIS HC A04/MF A01 CSCL 06R

The absorption characteristics of prolate spheroidal models consisting of homogeneous biological tissues radiated with plane waves at an arbitrary angle of incidence at and near the resonance frequency were evaluated. A general formulation of Stevenson's method in the third approximation is presented which can be applied to an arbitrary angle of incidence and leads to an improvement in frequency range of validity and accuracy as compared with first order solutions. The extended boundary condition emthod is also presented since it was found to be inplementable for realistic models at frequencies approaching resonance. GRA

N80-21029# Research Triangle Inst., Research Triangle Park, N. C.
FORMULATION OF A PRELIMINARY ASSESSMENT OF HALOGENATED ORGANIC COMPOUNDS IN MAN AND ENVIRONMENTAL MEDIA Annual Report, Nov. 1976 - Dec. 1978
Edo D. Pellizzari, Mitchell D. Erickson, and R. A. Zweidinger Jul. 1979 469 p refs
(Contract EPA-68-01-4731)
(PB80-112170; EPA-560/13-79-006) Avail: NTIS HC A20/MF A01 CSCL 06S

A model is developed for making a comparative assessment of halogenated organics in man and environmental media. The most prominent and biologically important substances are selected for an epidemiological study. K.L.

N80-21030# Massachusetts Inst. of Tech., Cambridge. Artificial Intelligence Lab.
K-LINES: A THEORY OF MEMORY
Marvin Minsky Jun. 1979 25 p refs
(Contract N00014-79-C-0260)
(AD-A078116; AI-M-516) Avail: NTIS HC A02/MF A01 CSCL 05/10

Most theories of memory suggest that when we learn or memorize something, some representation of that something is constructed, stored, and later retrieved. This raises questions like: How is information represented? How is it stored? How is it retrieved? Then, how is it used? This paper tries to deal with all of these at once. When you get an idea and want to remember it, you create a K-line for it. When later activated, the K-line induces a mental state resembling the one that created it. A partial mental state is a subset of those mental agencies operating at one moment. This view leads to many ideas about the development, structure and physiology of Memory, and about how to implement frame-like representations in a distributed processor. GRA

N80-21031# National Technical Information Service, Springfield, Va.
SIGNS AND DISPLAY SYSTEMS: GRAPHIC DESIGN AND HUMAN ENGINEERING. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1964 - Nov. 1979
Edith Kenton Dec. 1979 196 p Supersedes NTIS/PS-78/1195; NTIS/PS-77/1081; NTIS/PS-76/0967; NTIS/PS-75/073
(PB80-803158; NTIS/PS-78/1195; NTIS/PS-77/1081; NTIS/PS-76/0967; NTIS/PS-75/073) Avail: NTIS HC $30.00/MF $30.00 CSCL 05E

The bibliography contains annotated references to research reports covering varied aspects of design of signs and displays, particularly in the transportation field. Specific topics include: highway sign design; highway sign legibility, traffic control devices, transportation graphics; visual perception of aircraft instrument display systems; human engineering of symbols; and legibility of maps. This updated bibliography contains 189 abstracts, 19 of which are new entries to the previous edition. GRA

N80-21032# Federal Aviation Administration, Washington, D. C.
SUMMARY OF DEPARTMENT OF TRANSPORTATION/FEDERAL AVIATION ADMINISTRATION TASK FORCE ON CREW WORKLOAD REPORT Final Report, May 1977 - Aug. 1978
George C. Hay, Charles D. House, and Richard L. Sulzer Dec. 1978 216 p refs
(AD-A068189; FAA-EM-78-15) Avail: NTIS HC A10/MF A01 CSCL 01/2

An analysis of the total accident experience of U.S. certificated air-route carriers reveals that there is no evidence that a flight-deck crew of two in an appropriately designed aircraft is less safe than a crew of three pilots. A review of the procedures followed in the airworthiness certification of recent U.S. air-carrier aircraft indicates that manufacturers have demonstrated pilot workload in a fully modern and competent fashion, under the cognizance of FAA, and that actual crew complement approval is based on both the results of the workload demonstrations and the experience gained in a significant flight test program. A.R.H.

N80-21033*# Virginia Univ., Charlottesville. Dept. of Civil Engineering.
HUMAN COMFORT RESPONSE TO DOMINANT RANDOM MOTIONS IN LONGITUDINAL MODES OF AIRCRAFT MOTION
Ralph W. Stone, Jr. Jan. 1980 130 p refs
(Contract NAS1-14908)
(NASA-CR-159186; UVA/528156/MAE-CE79/130) Avail: NTIS HC A07/MF A01 CSCL 05H

The effects of random vertical and longitudinal accelerations and pitching velocity passenger ride comfort responses were examined on the NASA Langley Visual Motion Simulator. Effects of power spectral density shape were studied for motions where the peak was between 0 and 2 Hz. The subjective rating data and the physical motion data obtained are presented without interpretation or detailed analysis. There existed motions in all other degrees of freedom as well as the particular pair of longitudinal airplane motions studied. These unwanted motions, caused by the characteristics of the simulator may have introduced some interactive effects on passenger responses. J.M.S.

N80-21034*# Virginia Univ., Charlottesville. Dept. of Civil Engineering.
HUMAN COMFORT RESPONSE TO RANDOM MOTIONS WITH A DOMINANT PITCHING MOTION
Ralph W. Stone, Jr. Feb. 1980 94 p refs
(Contract NAS1-14908)
(NASA-CR-159140; UVA/528156/MAE-CE79/117) Avail: NTIS HC A05/MF A01 CSCL 05H

The effects of random pitching velocities on passenger ride comfort response were examined on the NASA Langley Visual Motion Simulator. The effects of power spectral density shape and frequency ranges from 0 to 2 Hz were studied. The subjective rating data and the physical motion data obtained are presented. No attempt at interpretation or detailed analysis of the data is made. Motions in all degrees of freedom existed as well as the intended pitching motion, because of the characteristics of the simulator. These unwanted motions may have introduced some interactive effects on passenger responses which should be considered in any analysis of the data. J.M.S.

N80-21035# Virginia Polytechnic Inst. and State Univ., Blacksburg. Human Factors Lab.
RESEARCH ON NEW ELECTRONIC DISPLAY TECHNOLOGIES Annual Summary Report, 1 Mar. 1978 - 31 Oct. 1979
H. L. Snyder, James C. Gutmann, and Willard W. Farley Dec. 1979 45 p refs
(Contract N00014-78-C-0238)
(AD-A079323; VPI-HFL-79-12/ONR-79-1) Avail: NTIS HC A03/MF A01 CSCL 05/8

This report summarized the work performed during the first year, dealing with two tasks. The first task, entitled 'Human Engineering Survey and Analysis', reviews the current flap panel display technologies, a summary of the human operator-critical characteristics of each technology, a technical summary of relevant human operator visual characteristics, and an evaluation of each technology by current visual display theoretical evaluation approaches. The second task, entitled 'Hue/Luminance Contrast Tradeoffs,' involved laboratory research designed to develop a metric by which luminance contrast and chrominance contrast can be traded off in display design to provide a metric of total effective display contrast. Work to date on both these tasks is summarized in this report. GRA

N80-21036# Calspan Advanced Technology Center, Buffalo, N.Y.
ESTABLISHMENT OF THE REPEATABILITY OF PERFORMANCE OF THE SA103C THREE YEAR OLD CHILD TEST DUMMIES Final Report, Sep. 1978 - Jun. 1979
Kenneth N. Naab and Stephen A. Baum Jun 1979 137 p refs
(Contract DOT-HS-8-02022)
(PB80-112204; CALSPAN-6385-V-1; DOT-HS-805-071) Avail: NTIS HC A07/MF A01 CSCL 13L

The performance repeatability of four SA103C three year old child test dummies was investigated. The primary measures of dummy sled test performance analyzed with the statistical methods were: (1) peak head resultant acceleration; (2) peak chest resultant acceleration; (3) maximum head horizontal displacement and (4) maximum knee horizontal displacement. An analysis of the absolute deviations of each data point from the overall means demonstrated that the dummy variations were within an acceptable level for all performance measures. In addition, performance comparison overlay time history graphs are presented for direct comparisons. GRA

N80-21959*# National Aeronautics and Space Administration, Washington, D. C.
EFFECT OF IMMOBILIZATION STRESS ON THE LEVEL OF MACROERGIC PHOSPHATES IN THE BLOOD OF RATS
V. I. Pudov and V. A. Sosenkov Mar. 1980 7 p refs Transl. into ENGLISH from Patol. Fiziol. Eksp. Ter. (USSR), no. 5, 1977 p 73-75 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3199)
(NASA-TM-76021) Avail: NTIS HC A02/MF A01 CSCL 06C

The effect of immobilization for 1, 2, and 24 hours, and of daily (for 2 hours for 7 days) immobilization on the blood nucleotide (ATP, ADP, AMP) level was studied on 79 male rats. A progressive reduction of the ATP content was most pronounced in immobilization for 24 hours. This was accompanied by an increase of lymphopenia and eosinopenia. A fall of the relative weight of the thymus and a weight gain of the adrenal glands was observed along with a reduction of ascorbic acid concentration in both of them. In case of daily immobilization for 2 hours, the ATP and ADP content on the 1st and 2nd day was below the normal level, and then showed a gradual increase, with complete normalization in 6-7 days, except for inorganic phosphorus the level of which remained lower than normal. R.E.S.

N80-21960*# National Aeronautics and Space Administration, Washington, D. C.
EFFECT OF TRANQUILIZERS ON ANIMAL RESISTANCE TO THE ADEQUATE STIMULI OF THE VESTIBULAR APPARATUS
Ya. B. Maksimovich and N. V. Khinchikashvili Mar. 1980 9 p refs Transl. into ENGLISH from Farmakol. Toksikol. (USSR), v. 42, no. 6, Jun. 1979 p 606-610 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-76109) Avail: NTIS HC A02/MF A01 CSCL 06C

The effect of tranquilizers on vestibulospinal reflexes and motor activity was studied in 900 centrifuged albino mice. Actometric studies have shown that the tranquilizers have a group capacity for increasing animal resistance to the action of adequate stimuli to the vestibular apparatus. Author

N80-21961*# National Aeronautics and Space Administration, Washington, D. C.
EFFECTS OF IMMOBILIZATION ON ARTICULAR CARTILAGE: AUTOHISTORADIOGRAPHIC FINDINGS WITH S35
C. DiGiovanni and E. deSantis Mar. 1980 33 p refs Transl. into ENGLISH from Arch. Putti Chir. Organi Movimento (Italy), v. 28, 1977 p 23-47 Transl. by Kanner (Leo) Associates, Redwood City, Calif. Original document prepared by Catholic Univ., Rome
(Contract NASw-3199)
(NASA-TM-76070) Avail: NTIS HC A03/MF A01 CSCL 06C

The effect of immobilization on the articular cartilage of rabbits was studied by light microscope. The knee joint of each rabbit was immobilized in a plaster in a position midway between flexion and extension for a 10 to 120 days period. Degenerative changes in the articular cartilage of increasing severity were observed. The fixation of the labeled SO4 by cartilage cells was decreased in advanced immobilization. R.E.S.

N80-21962*# National Aeronautics and Space Administration, Washington, D. C.
INVESTIGATION OF THE EFFECT OF SPACE FLIGHT FACTORS ON CHROMOSOMES IN SEEDS
L. G. Dubinina Mar. 1980 4 p Transl. into ENGLISH from the book "Issledovaniya Deystiviya Faktorov Kosmicheskogo Poleta na Khromosomy i Semenakh" Moscow, Nauka Press, 1978 p 106-107 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-76113) Avail: NTIS HC A02/MF A01 CSCL 06C

Frequency of mutations in postflight air-dry Crepis capillaris seeds, kept for five days aboard an artificial satellite was 36.0 + or - 1.9%, vs. 19.01 + or - 1.2% for seeds in a similar ground experiment. Both groups of seeds were prepared in identical concentrations and were treated by the same mutagen. The spectrum of mutations in postflight Crepis capillaris seeds contained a large number of chromosome-type mutations and some cells showed multiple alterations. Postflight seeds not treated with mutagens had a slightly higher level of mutability. R.E.S.

N80-21963*# National Aeronautics and Space Administration, Washington, D. C.
EFFECTS OF MOTOR PATTERNS ON WATER-SOLUBLE AND MEMBRANE PROTEINS AND CHOLINESTERASE ACTIVITY IN SUBCELLULAR FRACTIONS OF RAT BRAIN TISSUE
L. Z. Pevzner, L. Venkov, and L. Cheresharov Apr. 1980 9 p refs Transl. into ENGLISH from Ukr. Biokhim. Zh. (USSR), v. 50, no. 1, 1978 p 20-24 Transl. by Scientific Translation Service, Santa Barbara, Calif. Original doc. prep. by Acad. of Sci., Leningrad and Bulgarian Acad. of Sci., Sofia
(Contract NASw-3198)
(NASA-TM-76115) Avail: NTIS HC A02/MF A01 CSCL 06C

Albino rats were kept for a year under conditions of daily motor load or constant hypokinesia. An increase in motor activity results in a rise in the acetylcholinesterase activity determined in the synaptosomal and purified mitochondrial fractions while hypokinesia induces a pronounced decrease in this enzyme activity. The butyrylcholinesterase activity somewhat decreases in the synaptosomal fraction after hypokinesia but does not change under the motor load pattern. Motor load causes an increase in the amount of synaptosomal water-soluble proteins possessing an intermediate electrophoretic mobility and seem to correspond to the brain-specific protein 14-3-2. In the synaptosomal fraction the amount of membrane proteins with a low electrophoretic mobility and with the cholinesterase activity rises. Hypokinesia, on the contrary, decreases the amount of these membrane proteins. Author

N80-21964*# National Aeronautics and Space Administration, Washington, D. C.
THE EFFECTS OF RESTRAINT ON UPTAKE OF RADIOACTIVE SULFATE IN THE SALIVARY AND GASTRIC SECRETIONS OF RATS WITH PYLORIC LIGATION
J. A. Chayvialle, R. Lambert, and D. Ruet Mar. 1980 9 p refs Transl. into ENGLISH from Comt. Rend. Soc. Biol. (France), v. 166, no. 1, 1978 p 114-118 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-76073) Avail: NTIS HC A02/MF A01 CSCL 06C

The effects of restraint on the amount of nondialysable radioactive sulfate in the gastric wall and the gastric juice and saliva were investigated. It was found that restraint provokes a significant decrease in salivary radioactive sulfate. This, in turn, is responsible for the decrease of sulfate in the gastric contents observed under these conditions in rats with pyloric ligation. Esophageal ligation associated with this prevents passage of saliva and lowers the amount of radioactive sulfate in the gastric juice. Restraint causes then an increase in the amount of sulfate in the gastric juice, the value observed being very much lower than that of rats with a free esophagus. At the level of the gastric wall, the change observed during restraint does not reach a significant threshold. R.E.S.

N80-21965*# National Aeronautics and Space Administration, Washington, D. C.
EFFECT OF SCENEDESMUS ACUMINATUS GREEN ALGAE EXTRACTS ON THE DEVELOPMENT OF CANDIDA LIPOLYTIC YEAST IN GAS CONDENSATE-CONTAINING MEDIA
B. I. Bilmes, G. A. Kasymova, V. I. Runov, and N. N. Karavayeva Mar. 1980 7 p refs Transl. into ENGLISH from Uzh. Biol. Zh. (USSR), no. 4, Apr. 1979 p 12-14 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-76081) Avail: NTIS HC A02/MF A01 CSCL 06C

Data are given of a comparative study of the growth and development as well as the characteristics of the biomass of the C. Lipolytica yeast according to the content of raw protein, protein, lipids, vitamins in the B group, and residual hydrocarbons during growth in media with de-aromatized gas-condensate FNZ as the carbon source with aqueous and alcohol extracts of S. acuminatus as the biostimulants. It is shown that the decoction and aqueous extract of green algae has the most intensive stimulating effect on the yeast growth. When a decoction of algae is added to the medium, the content of residual hydrocarbons in the biomass of C. lipolytica yeast is reduced by 4%; the quantity of protein, lipids, thamine and inositol with replacement of the yeast autolysate by the decoction of algae is altered little. Author

N80-21966*# National Aeronautics and Space Administration, Washington, D. C.
CHANGES OF GAS METABOLISM, GAS HOMEOSTASIS AND TISSUE RESPIRATION IN RATS DURING PROLONGED HYPOKINESIA
V. L. Popkov, E. S. Mailyan, Yu. S. Galusko, Ye. A. Kovalenko, Ye. I. Zaytseva, I. A. Nitochkina, L. V. Stulova, and A. F. Ryazhskiy Dec. 1979 10 p refs Transl. into ENGLISH from Fiziol. Zh. SSSR (USSR), v. 66, no. 12, 1970, p 1808-1812
(Contract NASw-3198)
(NASA-TM-75982) Avail: NTIS HC A02/MF A01 CSCL 06C

The oxygen uptake and tissue gas homeostasis of restrained albinic rats remained relatively constant during a 60 day experiment. The gas metabolism in some tissues changed, and O2 consumption increased in the liver and decreased in the myocardium. Capacity for physical work was reduced by five times. Hypokinesia for 60 days resulted in a delay in the animals growth. Author

N80-21967*# National Aeronautics and Space Administration, Washington, D. C.
CONTENT OF LIPIDS IN BLOOD AND TISSUES OF ANIMALS DURING HYPODYNAMIA
I. V. Federov, Yu. P. Rylnikov, and T. M. Lobova Jan. 1980 11 p refs Transl. into ENGLISH from Kardiologiya (USSR), v. 13, no. 7, 1973 p 50-54 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-76023) Avail: NTIS HC A02/MF A01 CSCL 06C

Experiments on 97 rats and 50 rabbits were undertaken to study the influence of hypodynamia on the lipid content in the blood, liver, heart, and in the aorta. Reduction of muscular activity contributed to the increase of cholesterol and beta lipoprotein levels in the blood and to accumulation of cholesterol in the liver and the heart. The total lipid content in these tissues decreased. In the aorta the total lipid content increased, while lecithin and cephalin figures went down. The character of biochemical changes in hypodynamia resembles in many ways the lipid metabolism changes in atherosclerosis. Author

N80-21968*# National Aeronautics and Space Administration, Washington, D. C.
METABOLISM AND ACTIVITY OF ZOXAZOLAMINE IN WHITE RATS DURING FORCED IMMOBILIZATION WITH AND WITHOUT HYPERTHERMIA
L. Buchel and M. Murawsky Mar. 1980 24 p refs Transl. into ENGLISH from Arch. Sci. Physiol. (France), v. 27, 1973 p 37-53 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-76074) Avail: NTIS HC A02/MF A01 CSCL 06C

The influence of restraint of rats held either at normal body temperature or at lowered body temperature as related to the effects of the muscle relaxant zoxazolamine was studied. The techniques used and experimental results obtained are presented. R.C.T.

N80-21969# Drexel Univ., Philadelphia, Pa. Dept. of Chemistry.
PHYSICAL AND CHEMICAL STUDIES OF CHLOROPHYLL IN MICROEMULSIONS Progress Report
Raymond A. Mackay 1979 22 p refs
(Contract EG-77-S-02-4452)
(COO-4452-001) Avail: NTIS HC A02/MF A01

Initial studies were designed to provide fundamental information on both the nature of photoreactions in microemulsions and the utility of these media as solvents for absorbers of solar energy. As a test system, the photoreduction of absorbed dye (methyl red and crystal violet) sensitized by chlorophyll a in an anionic mineral oil in water microemulsion was studied. Using ascorbate as the water soluble reducing agent and pigment concentrations of less than one per drop, the reaction exhibits a pseudo first order dependence on crystal violet, but a pseudo zero order dependence on methyl red. The effect of sensitizer, ascorbate concentration, and light intensity on the quantum yield was also examined. These studies were then extended to include concentrated chlorophyll solutions, microemulsions of varying charge type, product catalysis and synthetic porphyrins. DOE

N80-21971*# National Aeronautics and Space Administration, Washington, D. C.
AGE RELATED CHANGES IN THE BONE TISSUE UNDER CONDITIONS OF HYPOKINESIA
E. P. Podrushnyak and E. I. Suslov Apr. 1980 7 p refs Transl. into ENGLISH from Fiziol. Zh. (USSR), v. 9, no. 6, Nov. - Dec. 1973 p 841-843 Transl. by Kanner (Leo) Associates, Redwood City, Calif. Original doc. prep. by USSR Academy of Medical Sciences, Kiev
(Contract NASw-3199)
(NASA-TM-76019) Avail: NTIS HC A02/MF A01 CSCL 06S

Microroentgenography of nine young people, aged 24-29, before and after hypokinesia (16-37 days strict bed rest), showed that the heel bone density of those with initially high bone density generally decreased and that of those with initially low bone density generally increased. X-ray structural analysis of the

femurs of 25 corpses of accidentally killed healthy people, aged 18-70, data are presented and discussed, with the conclusion that the bone hydroxyapatite crystal structure stabilizes by ages 20 to 25, is stable from ages 25 to 60 and decreases in density after age 60. It is concluded that bone tissue structure changes, both with age, and in a comparatively short time in hypokinesia. Author

N80-21972*# Virginia Polytechnic Inst. and State Univ., Blacksburg.

DEVELOPMENT OF A STEREOFLUOROSCOPY SYSTEM Final Report

D. B. Rivers Oct. 1979 30 p refs
(Contract NAS9-15287)
(NASA-CR-160568) Avail: NTIS HC A03/MF A01 CSCL 06B

A technique of 3-D video imaging, was developed for use on manned missions for observation and control of remote manipulators. An improved medical diagnostic fluoroscope with a stereo, real-time output was also developed. An explanation of how this system works, and recommendations for future work in this area are presented. R.C.T.

N80-21973*# National Aeronautics and Space Administration, Washington, D. C.

EFFECT OF SYREPAR AND OXAPHENAMIDE ON LIVER FUNCTION IN EXPERIMENTAL HYPOKINESIA

L. N. Skakun Jan. 1980 9 p refs Transl. into ENGLISH from Farmakol. Toksikol. (USSR), v. 41, no. 4, Jun. - Aug. 1978 p 465-469 Transl. by Scientific Translation Service, Santa Barbara, Calif. Original doc. prep. by Ternopol Medical Inst., USSR
(Contract NASw-3198)
(NASA-TM-76011) Avail: NTIS HC A02/MF A01 CSCL 06S

Experiments on albino rats showed that 30 day hypokinesia changes the reaction of the liver to cholagogues. The choleretic action of oxaphenamide as well as its inhibitory effect on synthesis of bile acids diminishes, while the influence of bilirubin secretion increases. Author

N80-21974*# National Aeronautics and Space Administration, Washington, D. C.

EFFECT OF HYPERBARIC OXYGENATION ON CARBOHYDRATE METABOLISM PROTEIN SYNTHESIS IN THE MYOCARDIUM DURING SUSTAINED HYPODYNAMIA

G. A. Makarov Jan. 1980 9 p refs Transl. into ENGLISH from Kardiologiya (USSR), v. 14, no. 2, 1974 p 73-77 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(NASA-TM-76012) Avail: NTIS HC A02/MF A01 CSCL 06S

Glycolysis and the intensity of protein synthesis were studied in 140 white male rats in subcellular fractions of the myocardium during 45 day hypodynamia and hyperbaric oxygenation. Hypodynamia increased: (1) the amount of lactic acids; (2) the amount of pyruvic acid; (3) the lactate/pyruvate coefficient; and (4) the activities of aldolase and lactate dehydrogenase. Hyperbaric oxygenation was found to have a favorable metabolic effect on the animals with hypodynamia. R.E.S.

N80-21975*# National Aeronautics and Space Administration, Washington, D. C.

RELIABILITY AND INFORMATION CONTENT OF TESTS WITH CARDIOLEADER IN CYCLIC TYPES OF SPORTS

V. L. Utkin Mar. 1980 11 p refs Transl. into ENGLISH from Teor. Prakt. Fiz. Kultury (USSR), no. 5, May 1979 p 10-14 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-76090) Avail: NTIS HC A02/MF A01 CSCL 06S

Tests with cardioleader to control the physical, technical and tactical preparedness of athletes in cyclic types of sports are discussed. Ways of increasing the reliability and information content of the tests were studied. R.E.S.

N80-21976*# National Aeronautics and Space Administration, Washington, D. C.

PRESERVATION OF EQUILIBRIUM IN ORTHOGRADE AND INVERTED BODY POSITIONS

L. P. Semenov and N. A. Rebyakova Mar. 1980 6 p Transl. into ENGLISH from Teor. Prakt. Fiz. Kulture (USSR), no. 5 May 1979 p 29-30 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-76112) Avail: NTIS HC A02/MF A01 CSCL 06S

The mechanism for regulation of the vertical pose with retention of equilibrium in the inverted body position was investigated. R.E.S.

N80-21977*# National Aeronautics and Space Administration, Washington, D. C.

HAZARDS OF HIGH ALTITUDE DECOMPRESSION SICKNESS DURING FALLS IN BAROMETRIC PRESSURE FROM 1 ATM TO A FRACTION THEREOF

A. M. Genin Jan. 1980 10 p Transl. into ENGLISH of Conf. Paper from Inst. of Med. and Biol. Problems, Min. of Health, Moscow, 1979 p 1-12 Presented at 10th Conf. of Joint Soviet-Am. Working Group on Space Biol. and Med., Houston, Tex., Oct. 1979 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-76015) Avail: NTIS HC A02/MF A01 CSCL 06S

Various tests related to studies concerning the effects of decompression sicknesses at varying pressure levels and physical activity are described. The tests indicate that there are no guarantees of freedom from decompression sicknesses when man transitions from a normally oxygenated normobaric nitrogen-oxygen atmosphere into an environment having a 0.4 atm or lower pressure and he is performing physical work. R.E.S.

N80-21978*# National Aeronautics and Space Administration, Washington, D. C.

MAIN TRENDS IN EXPERIMENTAL MORPHOLOGICAL RESEARCH IN ANGIOLOGY AND OUTLOOK FOR ITS DEVELOPMENT

N. A. Dzhavakhishvili and Ye. P. Melman Jan. 1980 10 p Transl. into ENGLISH from Arkh. Anat., Gistol. Embriol. (USSR), v. 66, no. 2, 1970 p 21-25 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-75980) Avail: NTIS HC A02/MF A01 CSCL 06E

The main prospective trends in the problem of collateral circulation and new trends in experimental angiology with respect to the effect of gravitational forces, hypodynamia and hypokinesia on the vascular bed are discussed. Author

N80-21979# Coast Guard Research and Development Center, Groton, Conn.

MARINE TRAFFIC DATA OF CHICAGO, ILLINOIS AND SOUTH SHORE OF LAKE MICHIGAN Final Report

J. J. Cherny, III, R. A. Silva, M. R. Young, and R. H. Charters Sep. 1979 118 p
(AD-A080060; CGR/DC-18/79) Avail: NTIS HC A06/MF A01 CSCL 15/5

Data was collected on the marine traffic and VHF-FM marine communications channel usage at Calumet Harbor, Chicago Harbor, and Lemont, Illinois, at the junction of the Chicago Sanitary and Ship Canal and Calumet-Sag Channel. The daily average of marine traffic, including large, medium, small and anchored vessels, and tugs-in-tow, transiting the Calumet Harbor/Indiana Harbor area is 48 and transiting Chicago Harbor is 312. The daily average of tug/barge and small vessel transits on the Chicago Sanitary and Ship Canal is 30; the Calumet-Sag Channel is 11. Approximately 300 hours of communications of VHF-FM Channel 16 and 150 hours of VHF-FM Channel 13 were recorded and monitored to determine channel efficiency (i.e., percentage of valid messages) and utilization. Channel 16 efficiency at Calumet Harbor is 47.76%; at Chicago Harbor, 66.50%; and at Lemont, 64.72%. R.E.S.

N80-21980*# Mitre Corp., Houston, Tex.
THE CREW ACTIVITY PLANNING SYSTEM BUS INTERFACE UNIT
M. A. Allen Dec. 1979 269 p refs
(Contract F19628-80-C-0001)
(NASA-CR-160566; MTR-473; JSC-16321) Avail: NTIS HC A12/MF A01 CSCL 05/4

The hardware and software designs used to implement a high speed parallel communications interface to the MITRE 307.2 kilobit/second serial bus communications system are described. The primary topic is the development of the bus interface unit. R.C.T.

N80-21981*# Life Systems, Inc., Cleveland, Ohio.
TESTING EVALUATION OF THE ELECTROCHEMICAL ORGANIC CONTENT ANALYZER Final Report
R. J. Davenport Nov. 1979 69 p refs
(Contract NAS9-15402)
(NASA-CR-160569; LSI-TR-334-4) Avail: NTIS HC A04/MF A01 CSCL 06K

The breadboard electrochemical organic content analyzer was evalauted for aerospace applications. An awareness of the disadvantages of expendables in some systems resulted in an effort to investigate ways of reducing the consumption of the analyzer's electrolyte from the rate of 5.17 kg/30 days. It was found that the electrochemical organic content analyzer can result in an organic monitor in the water quality monitor having a range of 0.1 to 100 mg/1 total organic carbon for a large number of common organic solutes. In a flight version it is anticipated the analyzer would occupy .0002 cu m, weigh 1.4 kg, and require 10 W or less of power. With the optimum method of injecting electrolyte into the sample (saturation of the sample with a salt) it would expend only 0.04 kg of electrolyte during 30 days of continuous operation. R.E.S.

N80-21982*# Texas A&M Univ., College Station. Adriance Lab.
THE EFFECT OF VARIETY AND MATURITY ON THE QUALITY OF FREEZE-DRIED CARROTS. THE EFFECT OF MICROWAVE BLANCHING ON THE NUTRITIONAL AND TEXTURAL QUALITY OF FREEZE-DRIED SPINACH Final Report
1979 131 p refs
(Contract NAS9-12434)
(NASA-CR-160567) Avail: NTIS HC A07/MF A01 CSCL 06H

Using carrots, the quality of freeze-dried products was studied to determine the optimum varieties and maturation stages for quality attributes such as appearance, flavor, texture, and nutritive value. The quality of freeze-dried carrots is discussed in terms of Gardner color, alcohol insoluble solids, viscosity, and core/cortex ratio. Also, microwave blanching of freeze-dried spinach was studied to determine vitamin interrelationships, anatomical changes, and oxidative deteriorations in terms of preprocessing microwave treatments. Statistical methods were employed in the gathering of data and interpretation of results in both studies. R.E.S.

N80-21983*# National Aeronautics and Space Administration, Washington, D. C.
PRINCIPLES FOR CLASSIFICATION OF WORK LOAD FOR WOMEN
A. O. Navakatikyan, A. P. Okhrimenko, A. N. Karakashyan, and V. A. Buzunov Mar. 1980 9 p refs Transl. into ENGLISH from Gig. Tr. Prof. Zabol. (USSR), no. 2, Jul. 1979 p 10-14 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-76084) Avail: NTIS HC A02/MF A01 CSCL 05H

In an attempt to develop guidelines for classification by degree of intensity of various kinds of physical work performed by women, the effects of different work loads on women as compared to men were studied under industrial and experimental conditions, including response of the cardiovascular and respiratory systems to specified physical exercises of increasing intensity. Physiological criteria for assessing female labor in terms of intensity are proposed. Author

N80-21984# Andrulis Research Corp., Bethesda, Md.
A STUDY OF AGENT-REACTIVE FABRICS FOR USE IN PROTECTIVE CLOTHING Final Report, May 1978 - Jul. 1979
Gerald Zon Dec. 1979 114 p refs
(Contract DAAK11-78-C-0060)
(AD-A079940; AD-E410219; ARC/LS/TR-0060-2; ARCSL-CR-80002) Avail: NTIS HC A06/MF A01 CSCL 15/2

A broad investigation has been carried out in order to obtain modified fabrics which exhibit catalytic activity toward hydrolytic decomposition of chemical warfare agents. The major areas of study included the development of chemically modified Nomex and cotton-blend fabrics, mechanistic inquiries with regard to factors which control simulant/agent hydrolysis, and the design and construction of a suitable fabric testing apparatus for comparative evaluation of candidate fabrics. GRA

N80-21985# European Space Research and Technology Center, Noordwijk (Netherlands). Product Assurance Div.
GUIDELINES FOR SPACECRAFT CLEANLINESS CONTROL
Paris ESA May 1979 33 p
(ESA-PSS-51/QRA-23-ESTEC-ISS-1) Avail: NTIS HC A03/MF A01

Possible spacecraft failures or malfunctions due to contamination are described. Ways are indicated in which contamination levels are predicted, spacecraft contamination is reduced, and contamination levels on and around the spacecraft are monitored. The cleaning procedures, the requirements regarding cleaning agents and cleanliness monitoring are discussed. Author (ESA)

N80-21986# Purdue Univ., Lafayette, Ind. School of Electrical Engineering.
ADVANCED INDUSTRIAL ROBOT CONTROL SYSTEMS
R. Paul, J. Luh, T. Anderson, J. Bender, E. Berg, B. Brown, C. S. Lin, M. Reminton, M. Walker, and C.-H. Wu Jul. 1979 92 p refs
(Grant NSF APR-77-14533)
(PB80-106396; TR-EE79-35; NSF/RA-790231; Rept-2) Avail: NTIS HC A05/MF A01 CSCL 13I

Work performed to improve the performance of current industrial robots by developing a consistent theory and task description language is described. The work includes: (1) the development of a simple joint motion control scheme to provide for the execution of structured robot task programs and to provide the capability of performing tasks on a moving conveyor; (2) the integration of teaching into the task program; (3) a direct on-line approach to motion time optimization; and (4) an approach to Cartesian motion control of a manipulator employing a fast exact method. GRA

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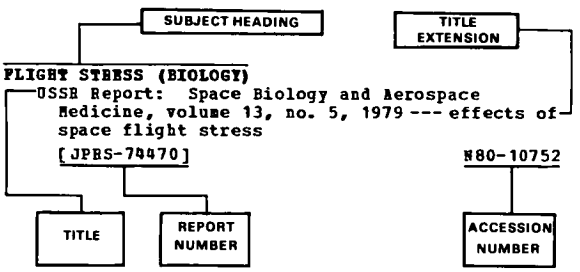

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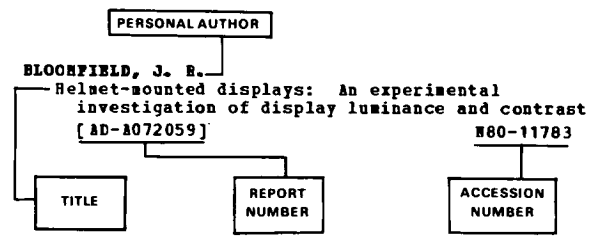

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